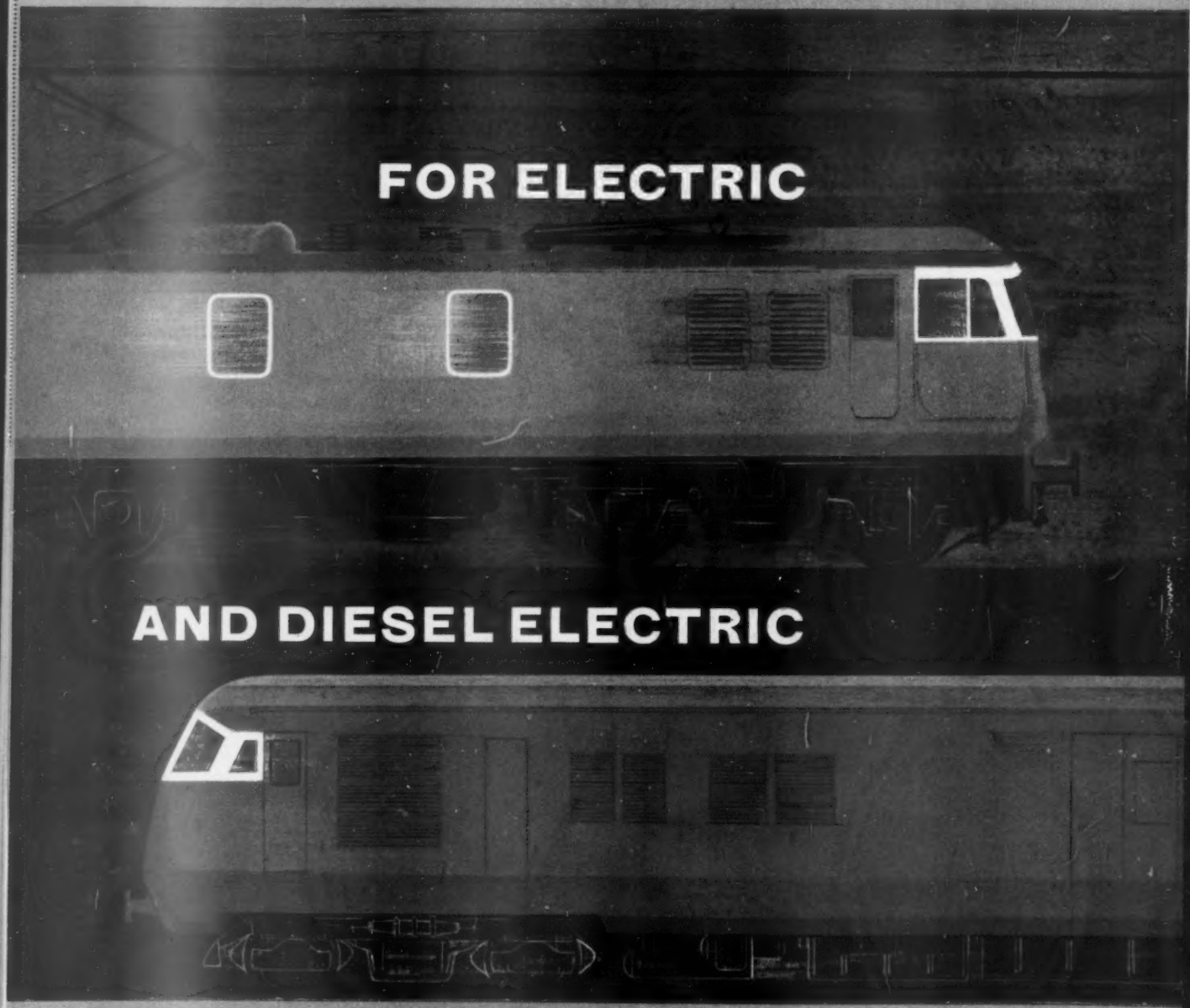
THE

RAILWAY GAZETTE

Price: Two Shillings FRIDAY, DECEMBER 29, 1961 Annually £5 by post



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G.E.C. (ENGINEERING) LIMITED : TRACTION DIVISION : BIRMINGHAM 6

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BELFORT
. . . the real wood veneer laminate with the melamine surface

Belfort Afrormosia used for panelling in the new Railway Coaches. Photograph reproduced by permission of London Midland Region, British Railways.

Designers have for centuries found that fine woods are the well-tested medium of their art.
In the field of design "Belfort," with its superb appearance and durable surface qualities is available in an extensive range of woods to appeal aesthetically to interior designers and railway carriage builders.
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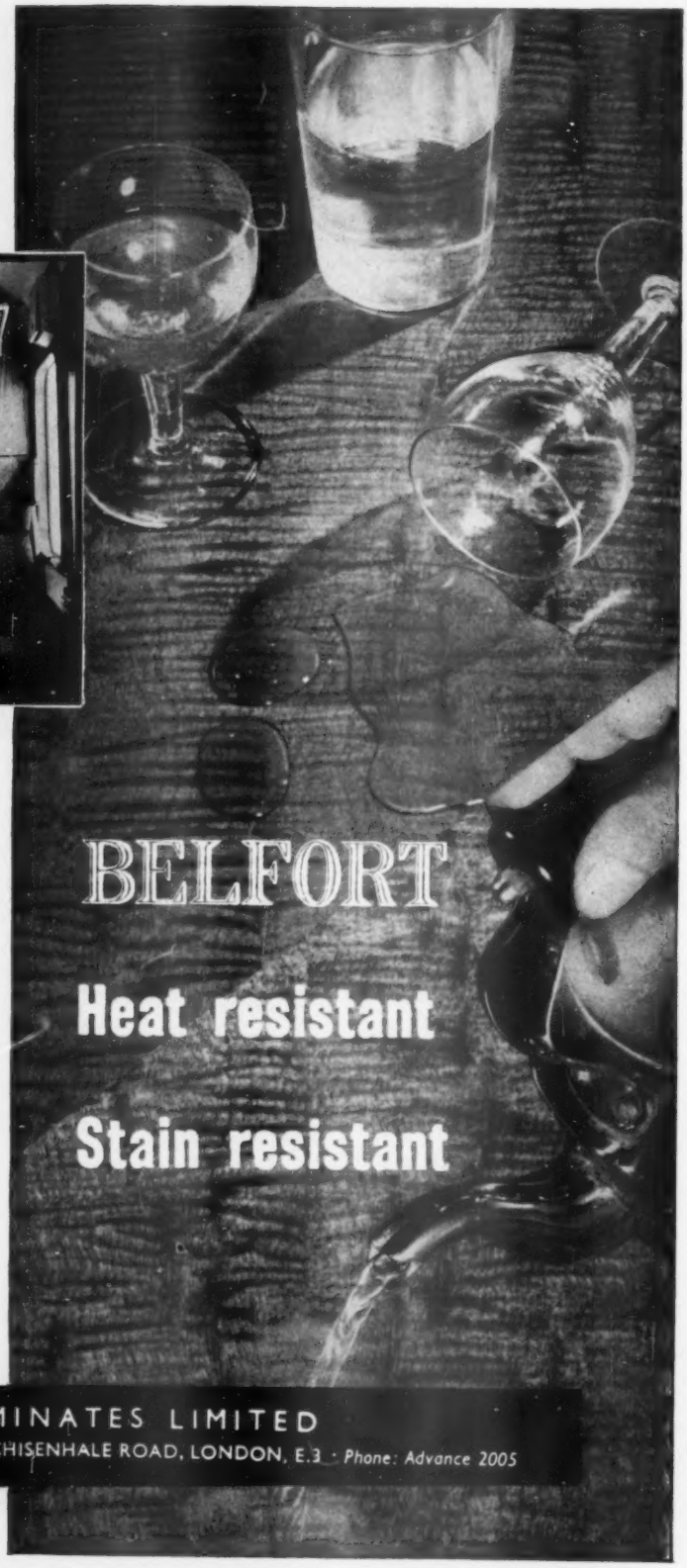

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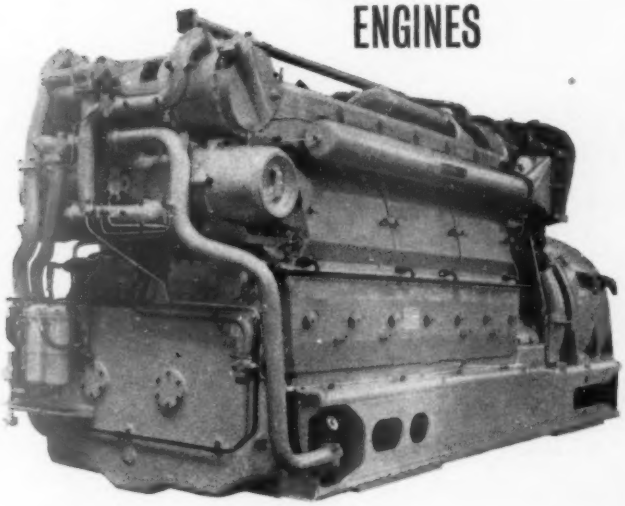

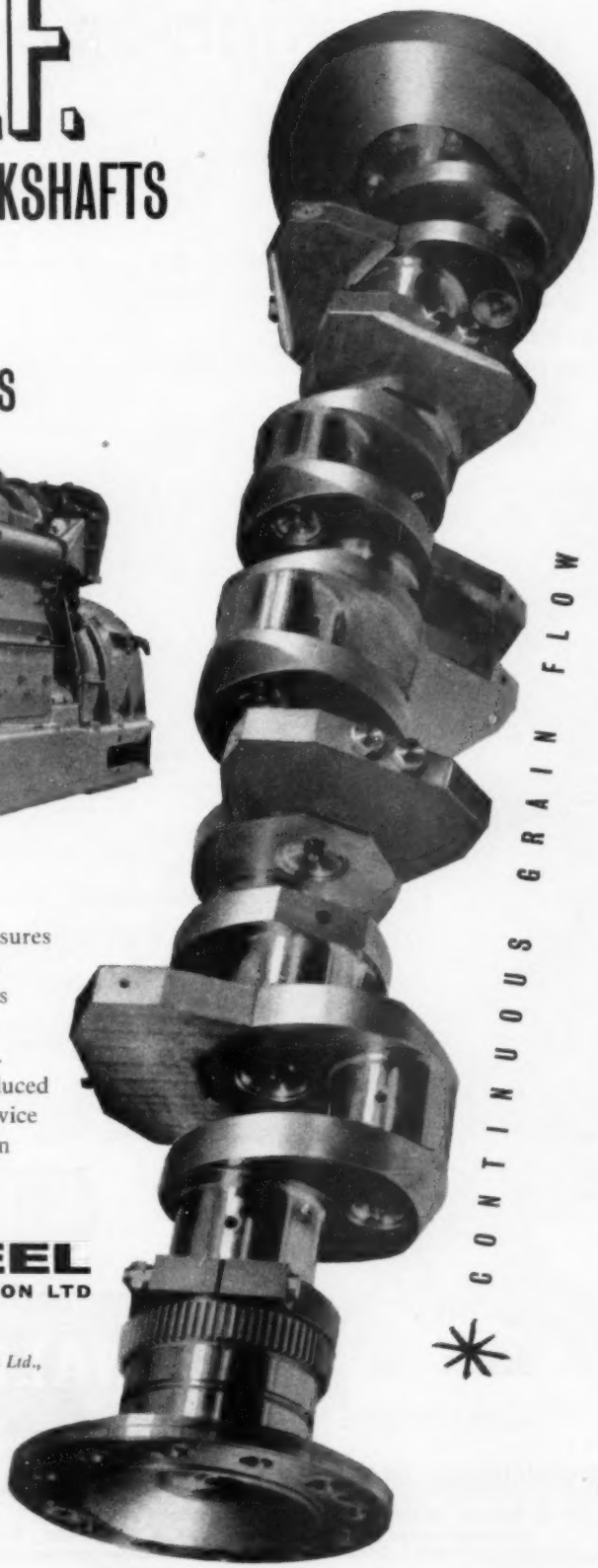

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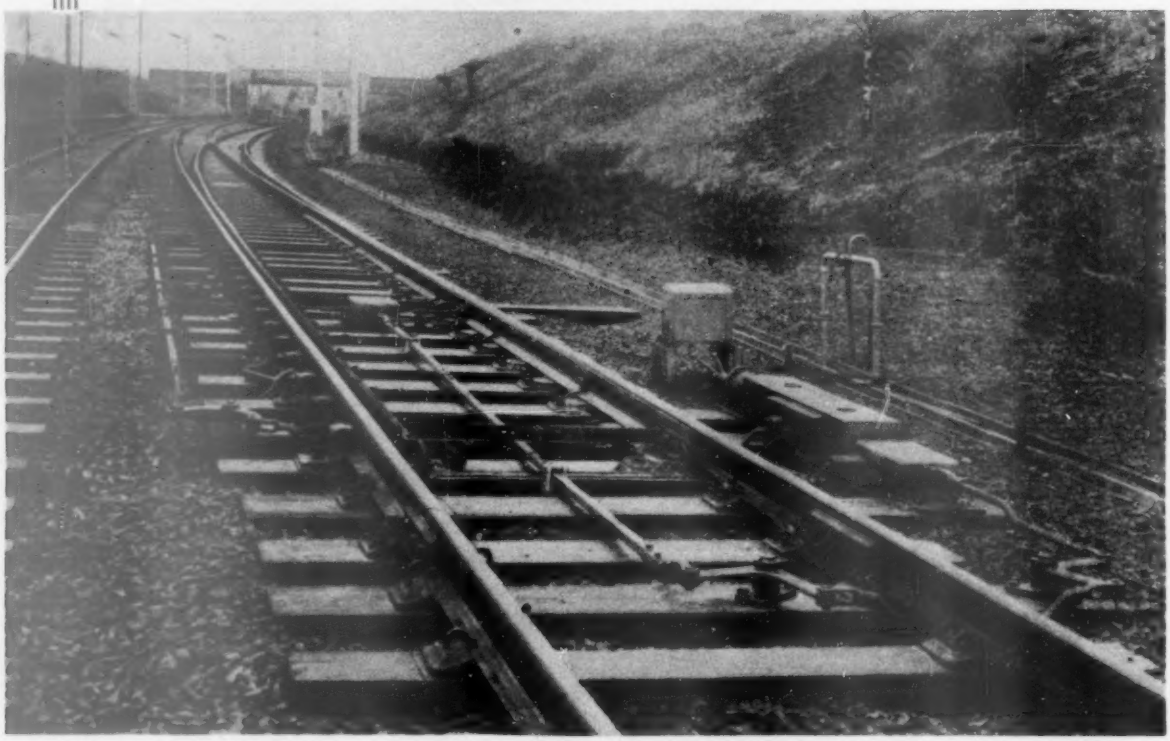

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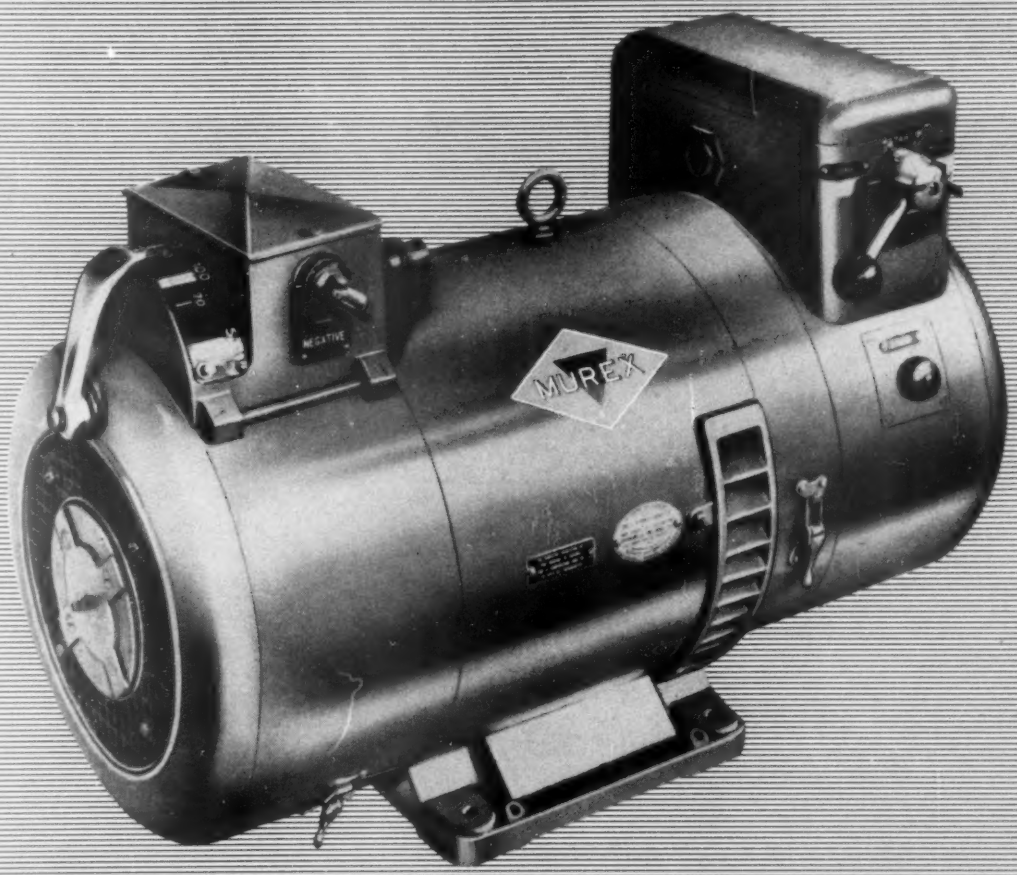

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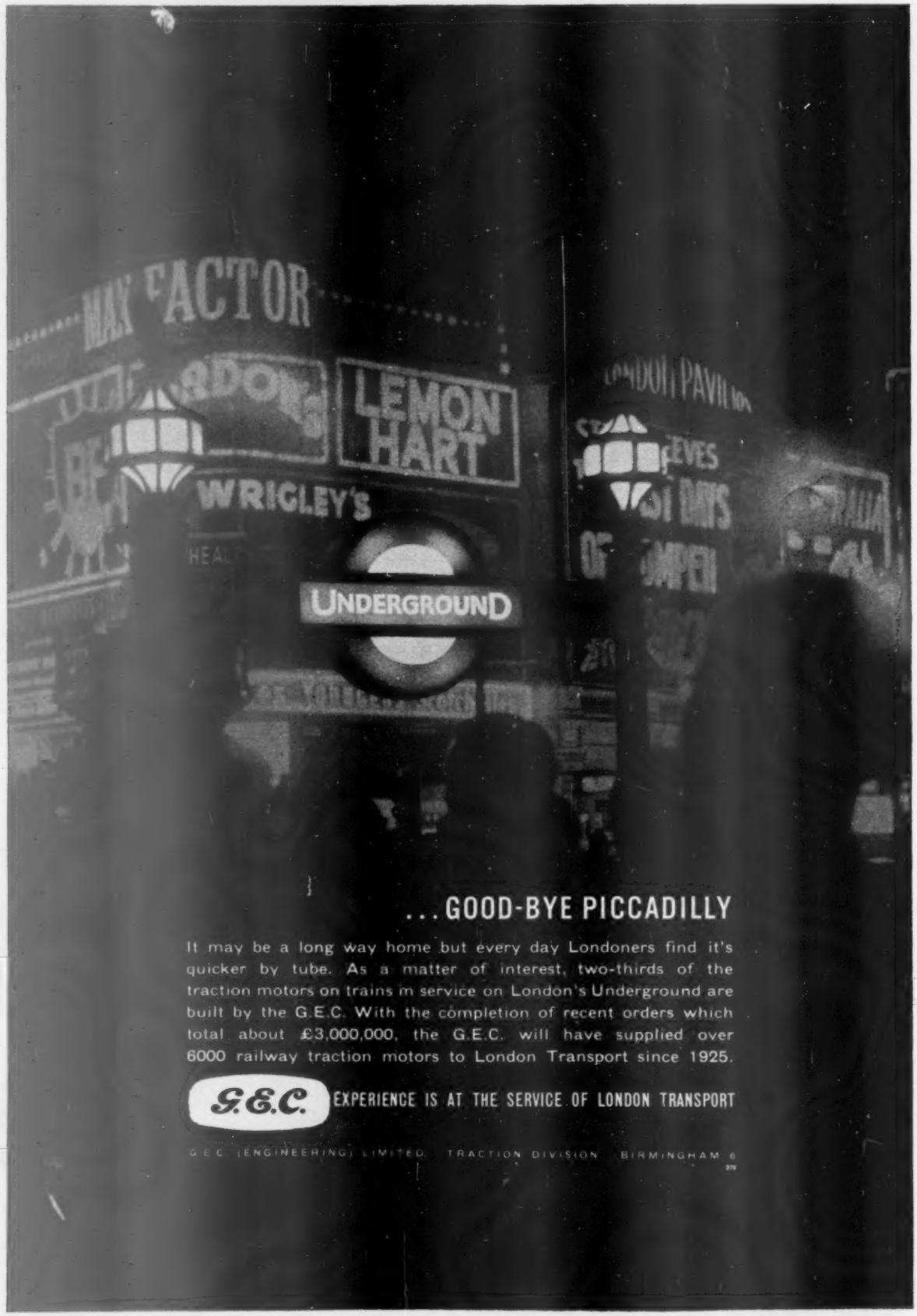

...GOOD-BYE PICCADILLY

It may be a long way home but every day Londoners find it's quicker by tube. As a matter of interest, two-thirds of the traction motors on trains in service on London's Underground are built by the G.E.C. With the completion of recent orders which total about £3,000,000, the G.E.C. will have supplied over 6000 railway traction motors to London Transport since 1925.

G.E.C. EXPERIENCE IS AT THE SERVICE OF LONDON TRANSPORT

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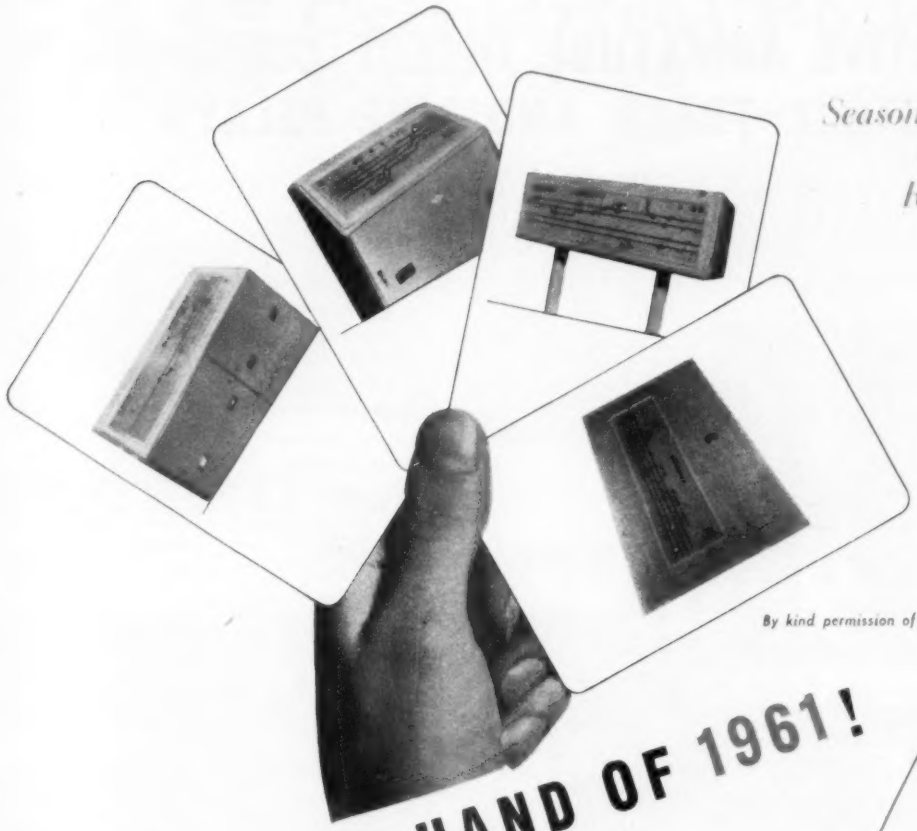

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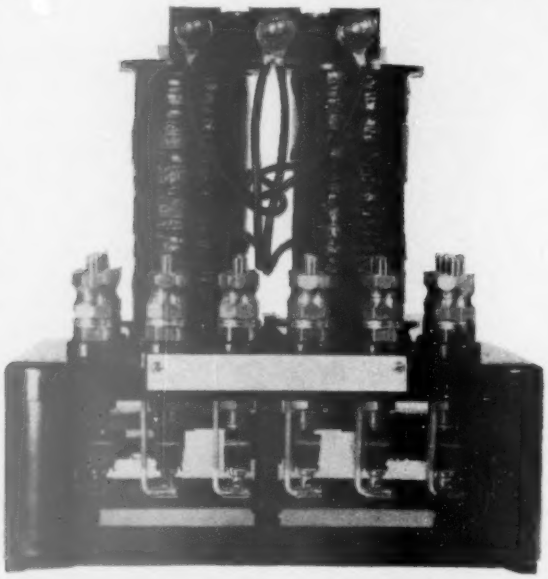
TRACTIVE ARMATURE DIRECT CURRENT NEUTRAL TRACK AND LINE RELAYS

TYER'S SIX ARM TYPE G2/6

conforming, in all respects, to the British Standard's Specification No. 1659 of 1950, with all material and workmanship of the highest quality.



Standard coil windings:
Track: 2.25 or 9 ohms.
Line: Class A. & B. 250 & 1000 ohms or to particular requirements.

Standard contact equipment:
4F 2F/B, 2F 4F/B, 6F/B.

Contact clearances:	Front	Back
Track & Line Relays Class A.	0.04 in.	0.02 in.
Line Relays Class B.	0.10 in.	0.06 in.

Contacts:
Front 50% silver, 50% graphite.
Arm & Back, fine silver.

Contact resistance:
Carbon to carbon 0.40 ohm.
Carbon to metal 0.18 ohm.
Metal to metal 0.03 ohm.

Casework:
Moulded two-piece unit with four rectangular glass sides, so cased to ensure the contact chamber being moisture-proof.

Height: 8⅛" Width: 7⅜" Depth: 7¼" Weight: approximately 13-lb.

Terminals:
O.B.A. nut type, to B.S.S. 442 or can be supplied to A.R.A. standards. Shrouds for terminals also catered for, as also short stems for detachable coupling units.

Terminal Markings moulded in relief:
Coils R1 and R2, A. arm, F. front contact and B. back contacts.

Coils:
Moulded bobbin, non rotatable, black tropical finish.

The Relays can be immunised against the effects of alternating current.

Slow drop-away and slow pick-up features can be provided to suit individual requirements.

Packing:
Cartons designed to contain the unit for supply and storing.

Similar four arm units as Track Relays, Type G2/T and Line Relays Type G2/L cater for all two, three or four-arm contact requirements. All relay units can be fitted with detachable terminal tops.

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GUILDFORD · SURREY
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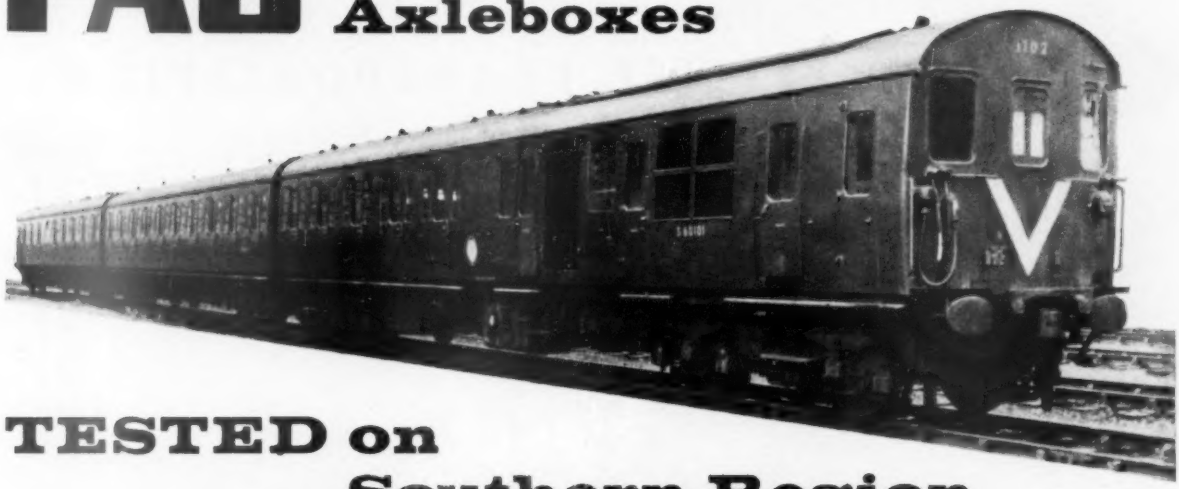
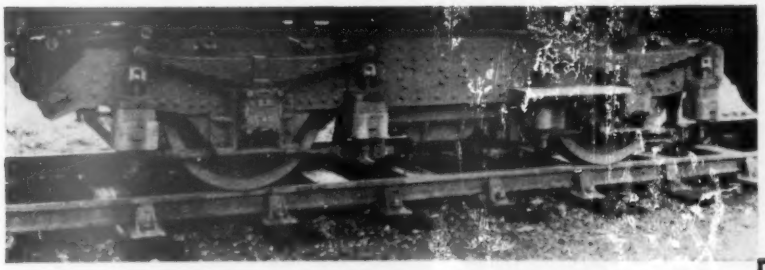
FAG Cylindrical Roller Axleboxes



TESTED on Southern Region

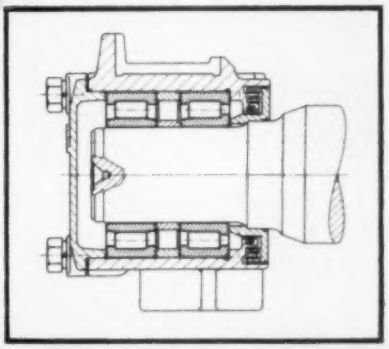


ABOVE: The diesel-electric unit fitted with FAG cylindrical roller axleboxes on Motor Coach and Driving Trailer.
LEFT: Close-up of one of the bogies after completion of 85,000 miles, at speeds of up to 75 m.p.h.
BELOW: The robustness and simplicity of the new design are readily appreciated from this cross-section
Photographs: Courtesy of British Railways, Southern Region

Axleboxes to a new design, developed from the U.I.C. approved design so extensively supplied to Continental Railways, were recently tested by the Southern Region over a route selected for severity of service. The test confirmed that FAG Cylindrical Roller Axleboxes are suitable for this class of stock, and examination after 85,000 miles indicates that they will have a long life.

This type of axlebox has the following outstanding features :—

- ★ Low overall frictional coefficient.
- ★ Low running temperatures over a wide speed range, with subsequent economy of lubricant.
- ★ Both radial and axial loadings are carried within the bearings, the radial forces being taken in the raceways and the thrust forces on the hardened lips of the bearings.
- ★ The cylindrical roller bearing, with its accepted high load capacity, is employed to best advantage.
- ★ Long life of roller bearing.
- ★ High factor of safety.
- ★ Simple axlebox construction with separable cylindrical roller bearing.
- ★ Easy and economical mounting, dismounting and inspection.
- ★ Mounting and dismounting readily carried out by induction heating equipment, so avoiding damage to axle journals associated with mechanical extractors.



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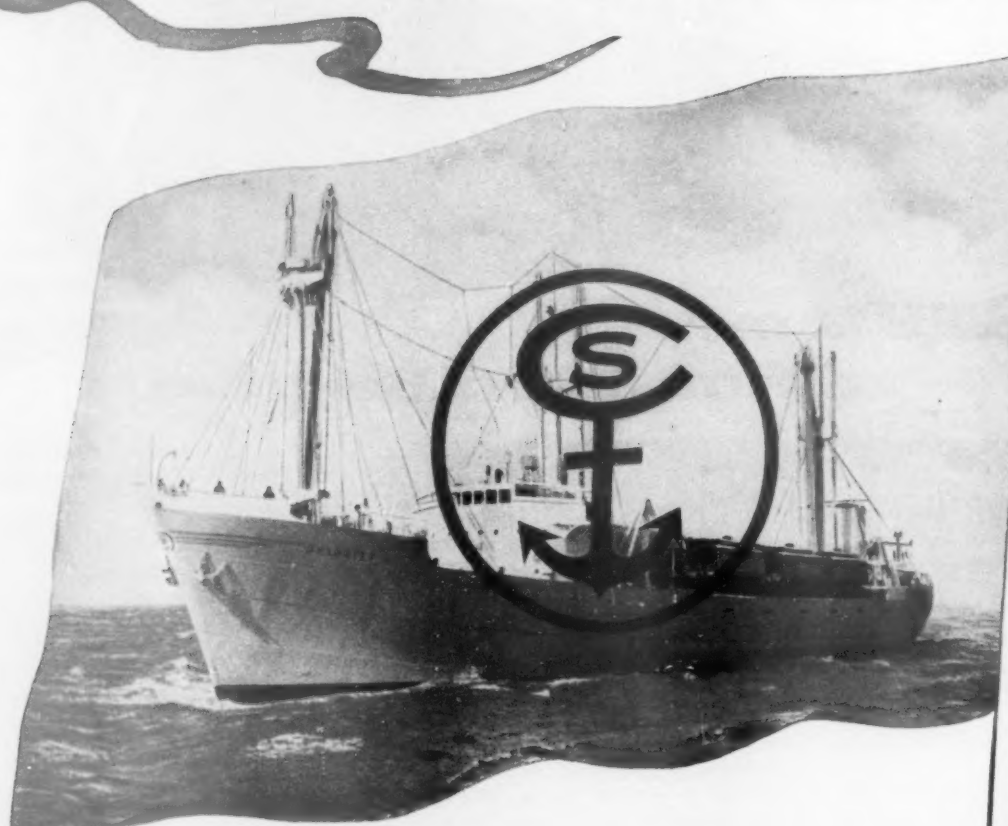

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Lifts up to 200 tons

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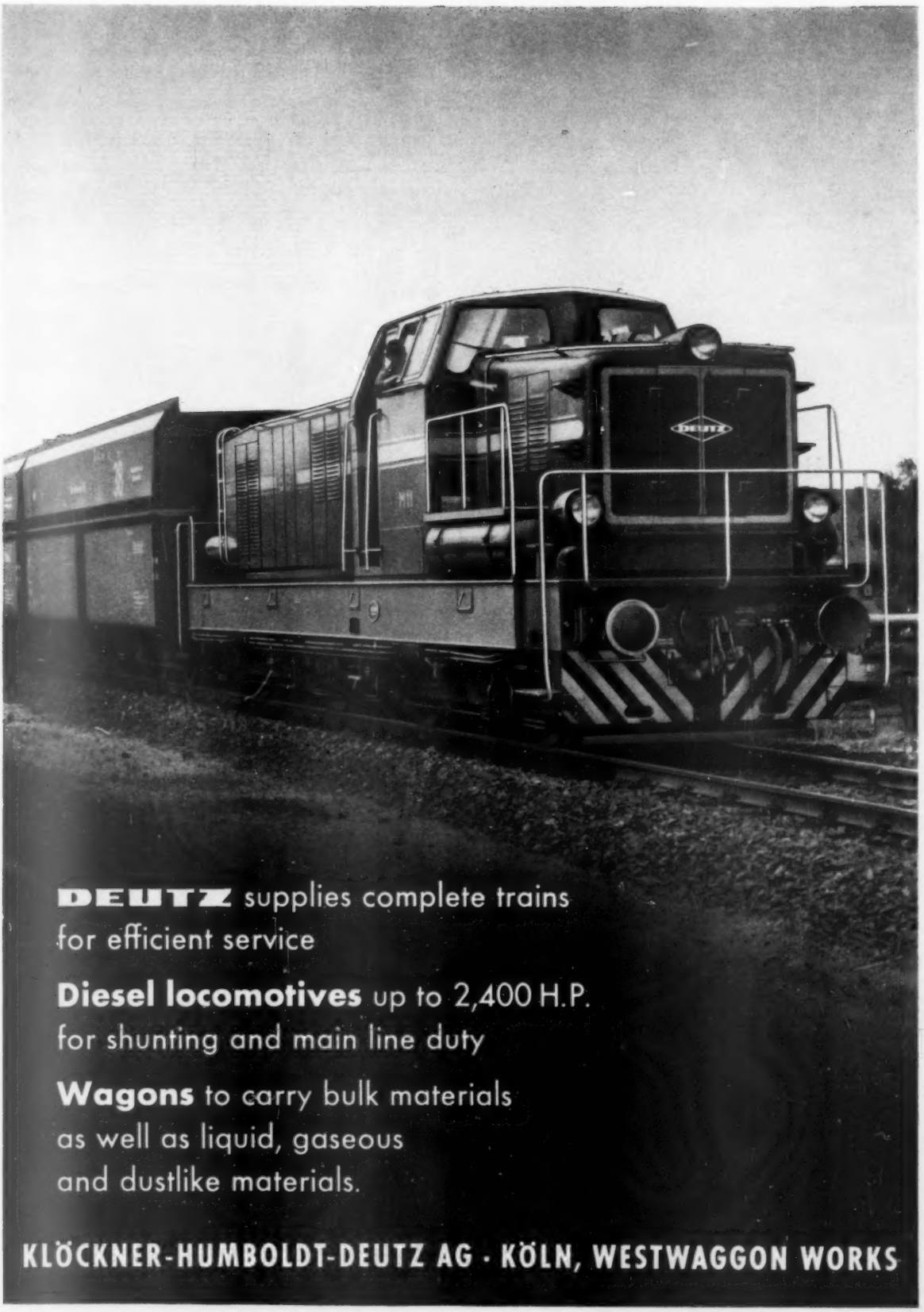
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Wagons to carry bulk materials
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INSIDE

ALHAMBRINAL INTERIOR PANELLING

"Alhambrinal" is the modern, permanent interior panelling and may be used for body or lining panels, bulkheads, ceiling panels and seat backs in railcars, carriages and public service vehicles.

The above photographs of Diesel Rail Cars with "Alhambrinal" panels are by courtesy of British Railways.

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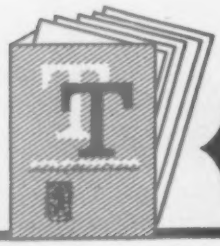
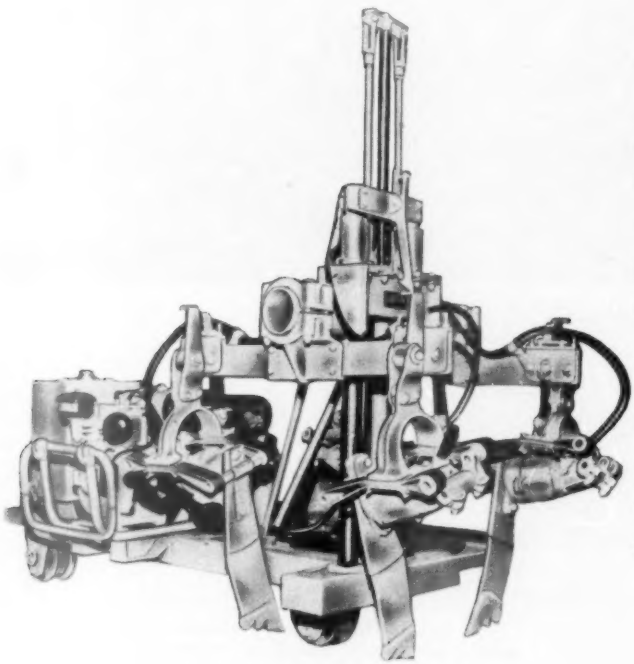


LITERATURE ON REQUEST. We will be glad to send you, without obligation, a booklet containing fuller details of the products mentioned in this advertisement. Samples of "Alhambrinal" and Roofings are also available.

NOW the world-famous JACKSON electric vibratory hand tamper pictured here at work on Danish State Railways can be mounted on self-propelled "LO" carrier chassis, as pictured below.

Sets of M22-4L Hand Tampers in use can be adapted to carrier in the field or "LO" carrier can be shipped from the factory with the tampers mounted.



THE "LO" carrier has separate engine drive for travel and a hydraulically actuated workhead to which is mounted four "LO" vibratory motors and blades. Electric power is provided to the vibratory motors from a standard M22A JACKSON portable generator on pneumatic tires which rolls on and off the carrier.

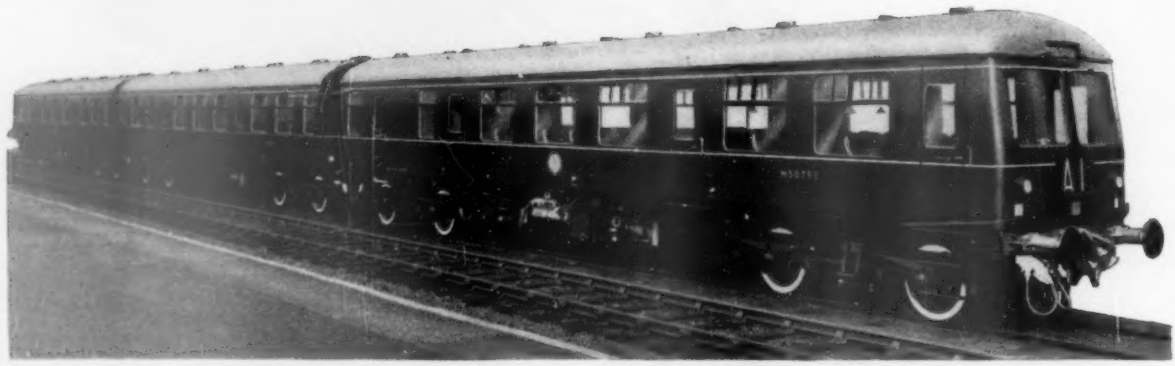
Two "LO" carriers can be coupled together to provide 4-face tamping on each end of the sleeper simultaneously and can be operated by one operator.

***THERE** is only one JACKSON. It is manufactured by JACKSON VIBRATORS, INC. in Ludington, Michigan, U.S.A. There are no foreign licensees authorized to manufacture JACKSON tampers.*

ELECTRIC TAMPER EXPORT COMPANY

205 WEST WACKER DRIVE • CHICAGO 6, ILLINOIS, U.S.A.

Steel & Iron CASTINGS



Steel and Iron Castings used in the construction of British Railways' Diesel Cars illustrated above, were made by us for Cravens Limited, Darnall Sheffield, 9

ROBERT HYDE CASTINGS

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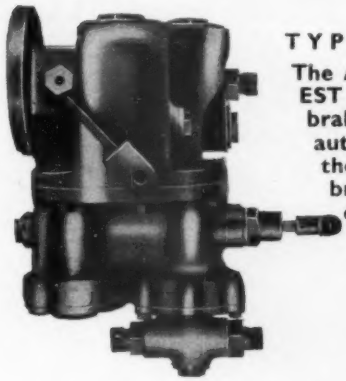
OERLIKON PATENT DESIGN

TYPE EST3d.

This standard and basic design of Triple Valve enables the controlled application and release of brakes on goods and passenger trains. It is suitable for all sizes of brake cylinder and is in accordance with the conditions laid down for the admission of goods and passenger trains for international traffic. Leaflet A.9.

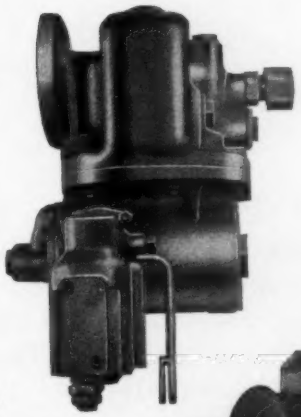


TYPE EST4d/AL.

The AL device used in conjunction with the EST Triple Valve, as illustrated, enables the brake cylinder pressure to be regulated automatically in proportion to the load on the vehicle, thus enabling the maximum brake efficiency to be obtained under all conditions. Among the advantages associated with this equipment are the simplicity of installation, further, the brake cylinder filling and releasing times are unaffected by load changes. Leaflet A.8.

TYPE EST4d/R
TRIPLE VALVE

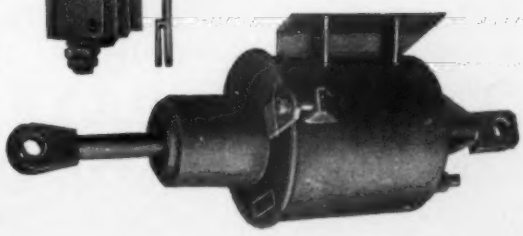
In this instance the type R device has been added to the EST Triple Valve to enable two-stage braking to be obtained. This arrangement when applied to high speed passenger coaches and controlled by the vehicle speed enables the maximum brake efficiency to be obtained and greatly reduces the distance required for stopping a train. This style may also be used for simple load and empty braking with the two stages Hand controlled. Leaflet A.5.



TYPE SB BRAKE CYLINDER

(Made under licence from STABEG)

A simple lightweight design of Brake Cylinder embodying a patent piston seal giving automatic lubrication to the cylinder walls and exceptionally long life to the seal. A further patent covers a security device which simplifies maintenance and examination of the Cylinder which is made in all standard sizes and styles. Leaflet A.14



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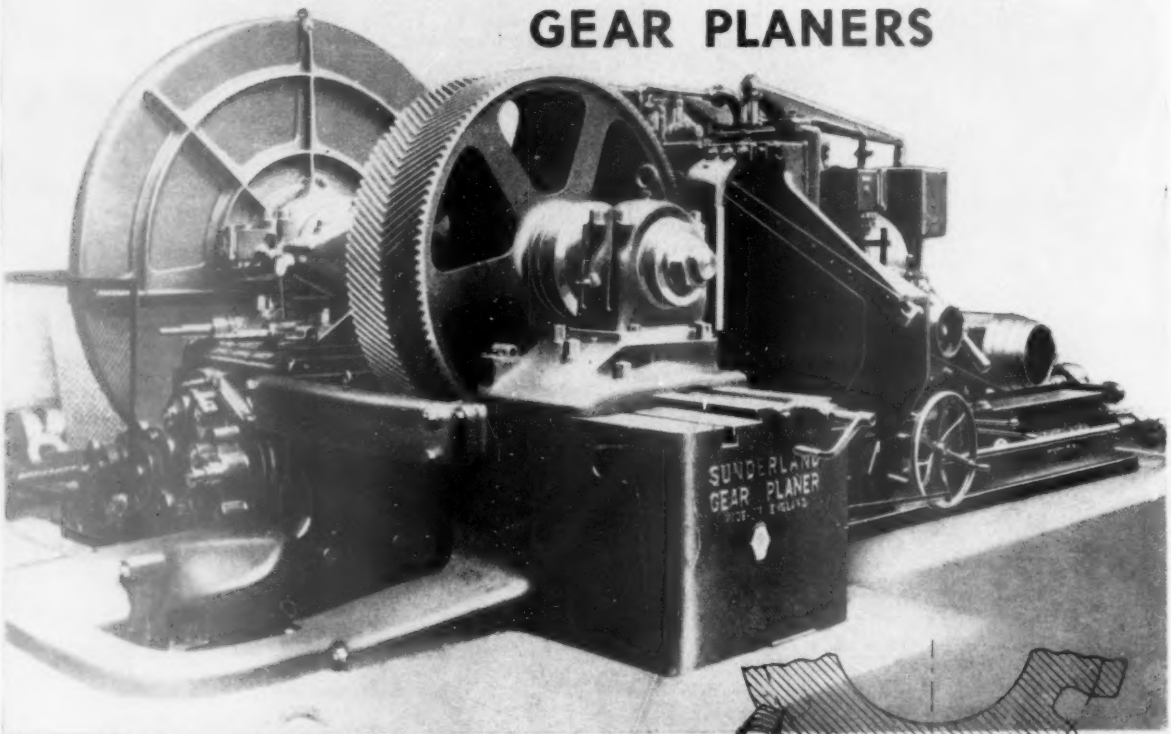
GEAR PLANERS



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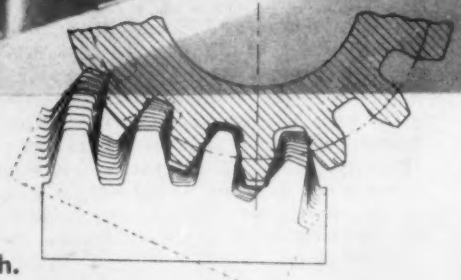

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Photo by courtesy of British Railways

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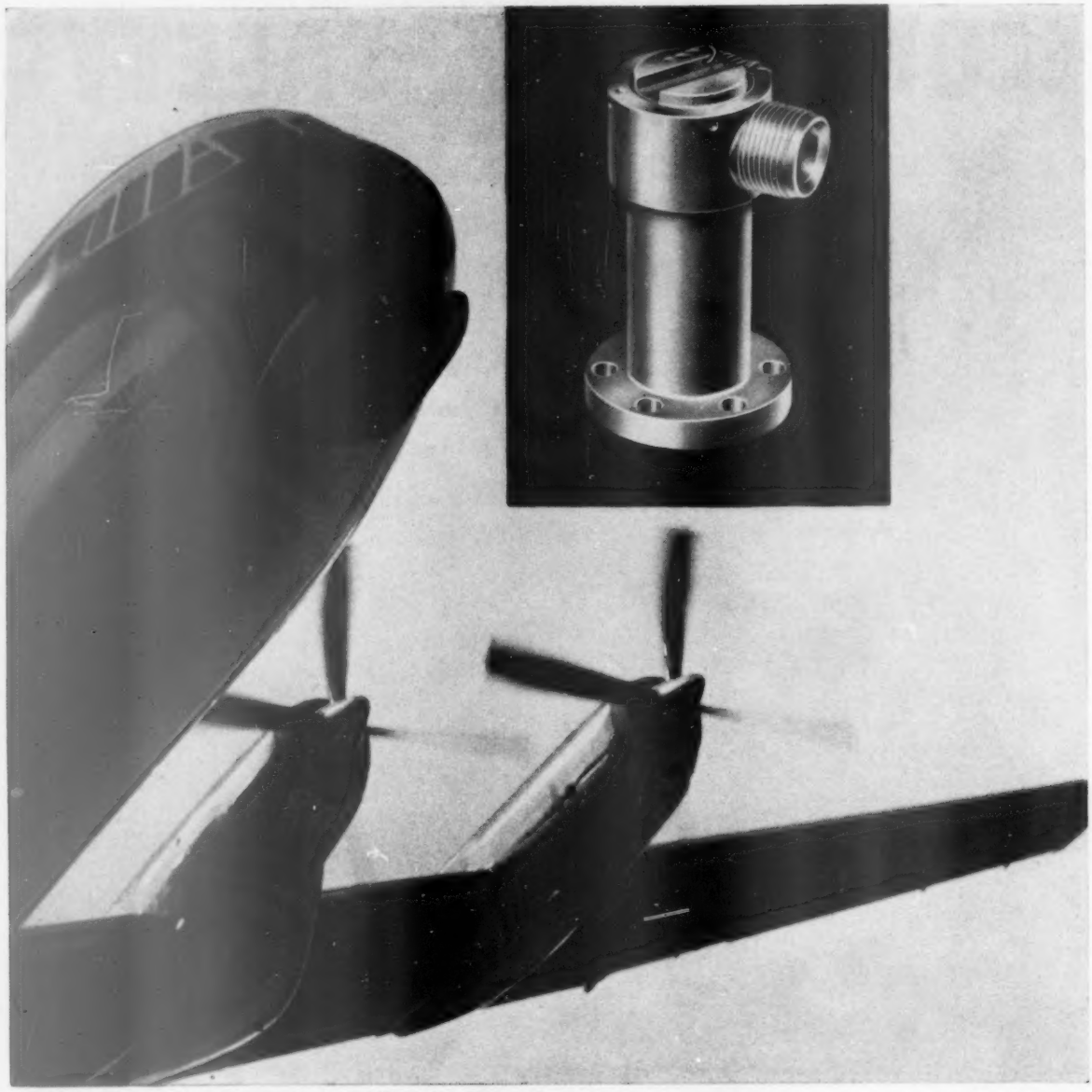

Photograph : Courtesy of Sperry Gyroscope Co. Ltd. and Vickers Ltd., Eng.neering

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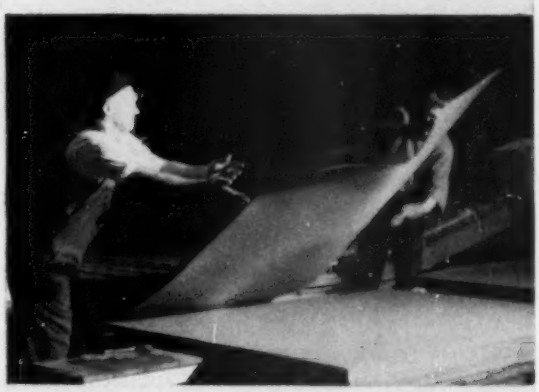

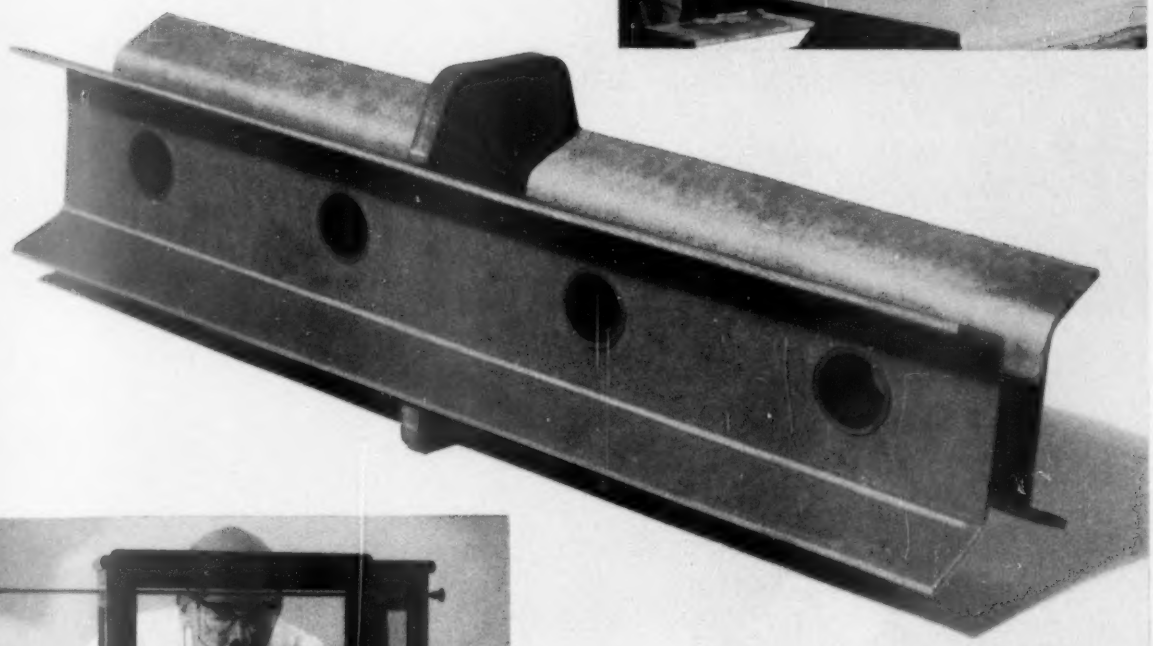

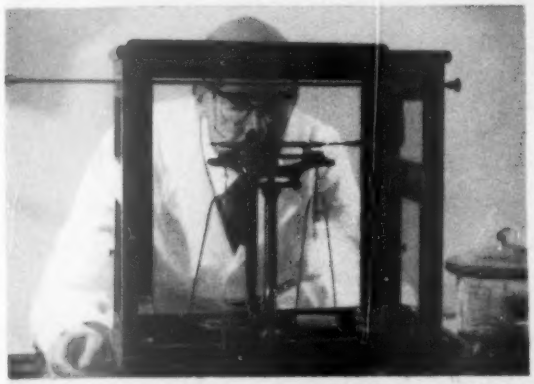

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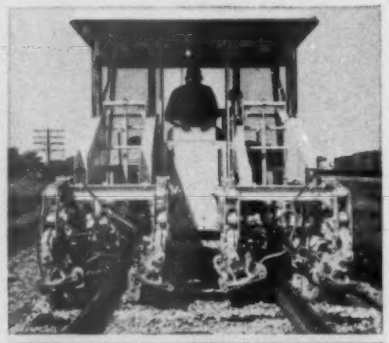

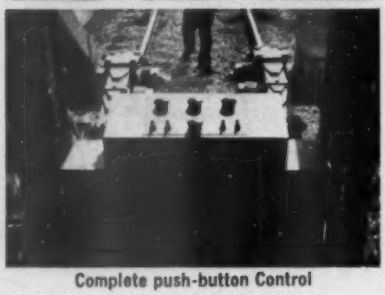

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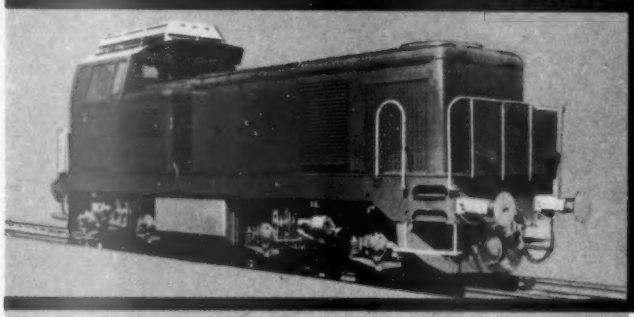
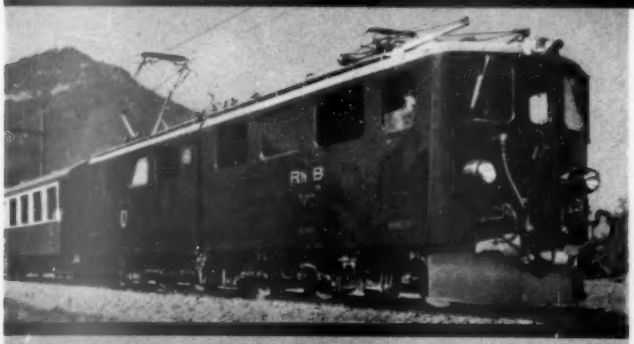
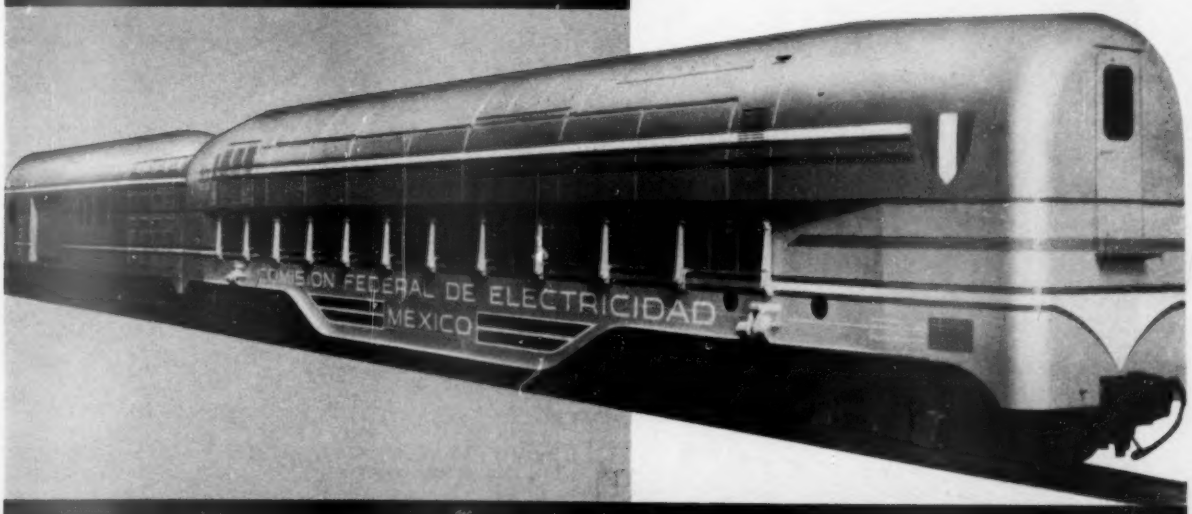


1200 HP BoBo type Diesel-electric locomotive of the Swiss Federal Railways



2400 HP metre-gauge single-phase A.C. locomotive, BoBoBo type of the Rhaetian Railway (Switzerland)

Mechanical part of a 8200 kW mobile Gas turbine plant of the Comisión Federal de Electricidad, Mexico



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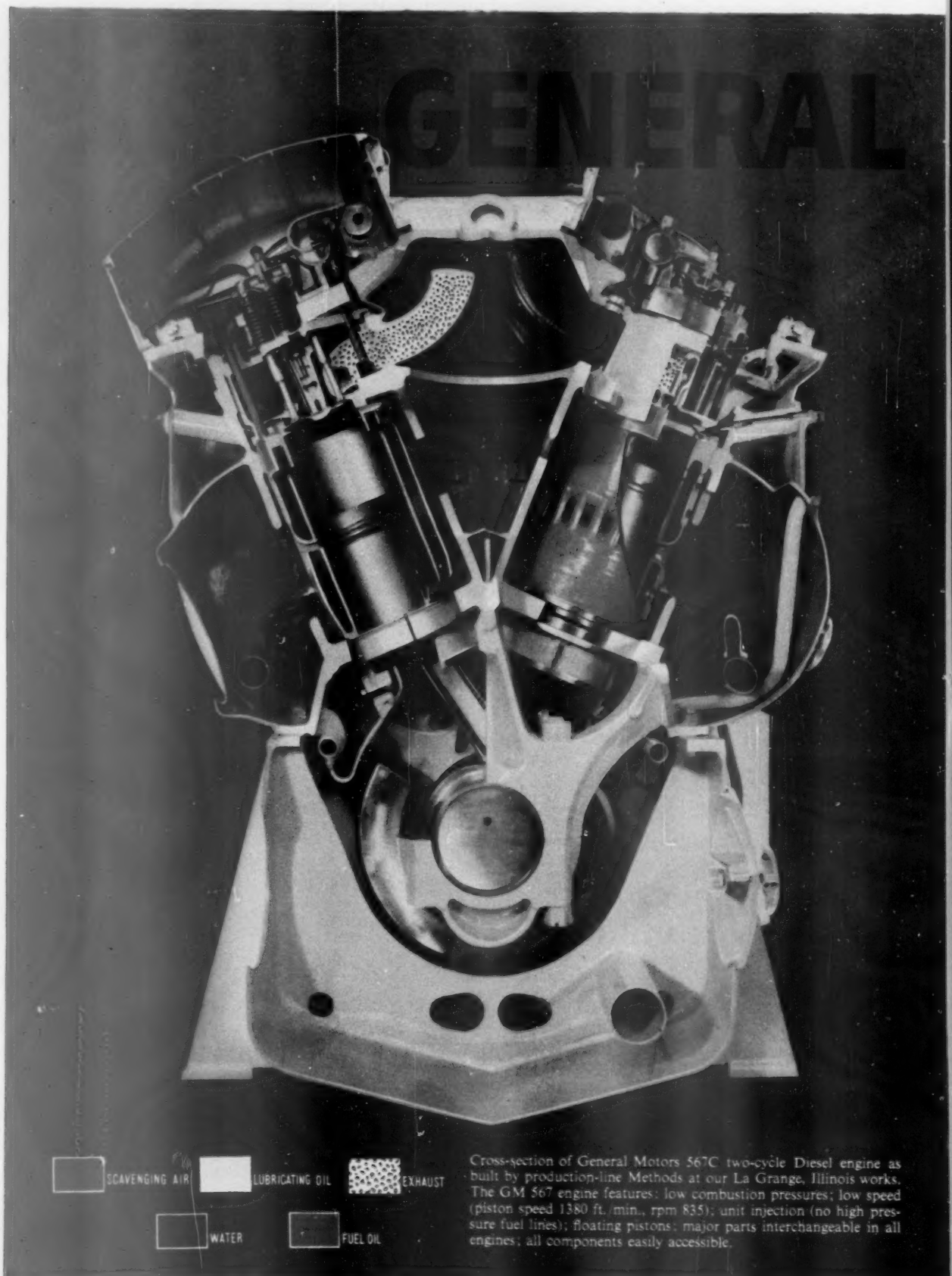
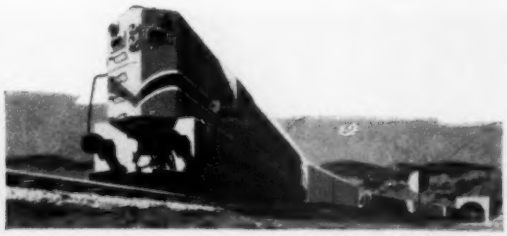


Cross-section of General Motors 567C two-cycle Diesel engine as built by production-line Methods at our La Grange, Illinois works. The GM 567 engine features: low combustion pressures; low speed (piston speed 1380 ft./min., rpm 835); unit injection (no high pressure fuel lines); floating pistons; major parts interchangeable in all engines; all components easily accessible.

MOTORS LOCOMOTIVES



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General Motors Diesel locomotives have an unequalled record for dependability and durability, with hundreds of units having accumulated *a million miles and more without major overhaul.*

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For example, a set of pistons for a GM 567 Diesel engine costs as much as 50 per cent *less* than pistons for another Diesel of comparable capacity — and GM 567 engine pistons frequently run more than 500,000 miles.

Moreover, GM locomotive parts are easily accessible—require less time to replace. A complete cylinder assembly of a 567 engine can be replaced by two men in less than one hour.

And because of high interchangeability, GM locomotives require the smallest parts inventory. The same piston fits all 567 engines from six to sixteen cylinders—and latest improvements in parts are made applicable to old units as well as new.

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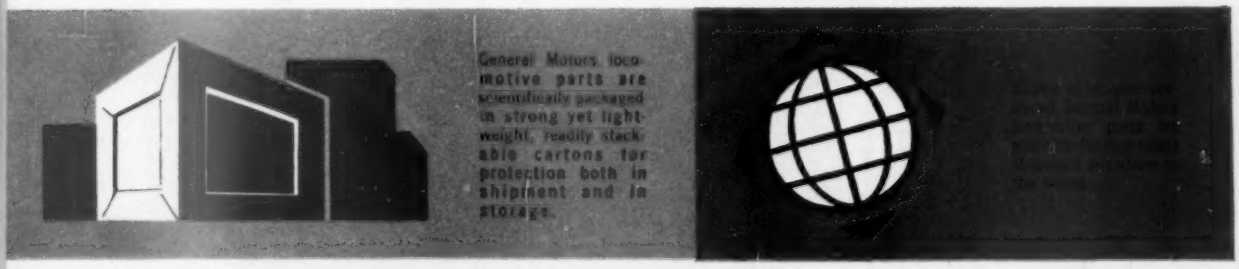
The *real* price of a Diesel locomotive is determined by what it costs to operate and maintain across its years of useful life. Actual service records of railways the world over prove that General Motors locomotives *cost less in the long run.*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LOCOMOTIVE PLANTS: Electro-Motive Division of General Motors, La Grange, Illinois, U.S.A. General Motors Diesel Limited, London, Ontario, Canada

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GM DIESEL POWER

GENERAL MOTORS LOCOMOTIVES

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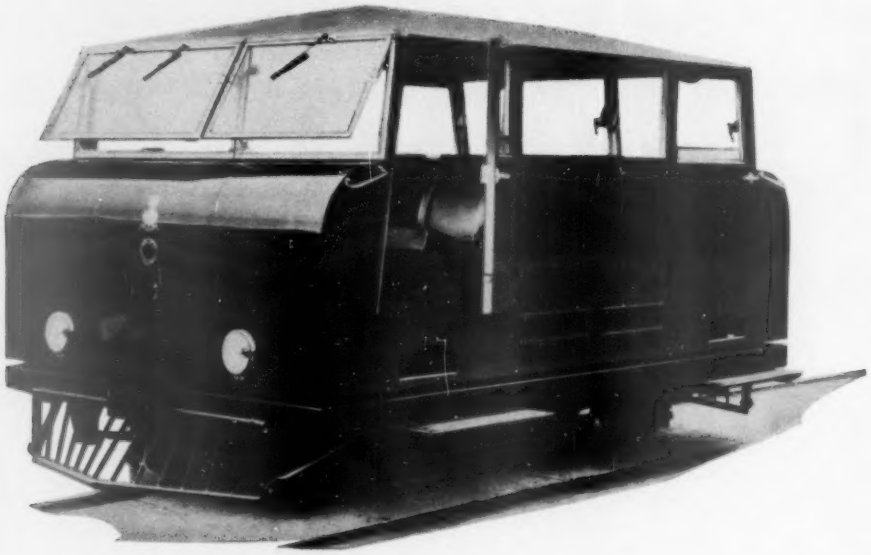

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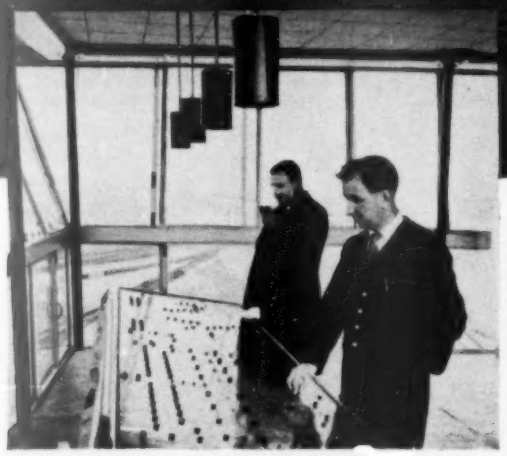

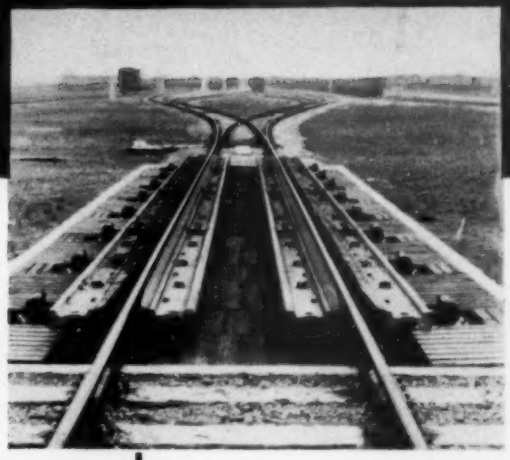

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33 miles of track . . . 50 sorting sidings . . . 4,000 wagons and 220 trains handled each day . . . this is the size of the Margam achievement. This fully-automatic marshalling yard with computer and radar control is a brilliant 'first' for Britain—and an outstanding achievement for AEI-GRS equipment which incorporates the following important features:

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AEI-GRS Equipment at Margam, British Railways, Western Region. (*Left*) Desk in control tower at Margam showing marshalling yard controls (nearest camera) and Type NX Route Relay Interlocking Controls for reception sidings at other end. (*Right*) View of secondary retarder. A radar head is visible at top of picture. (Photographs by courtesy of British Railways)

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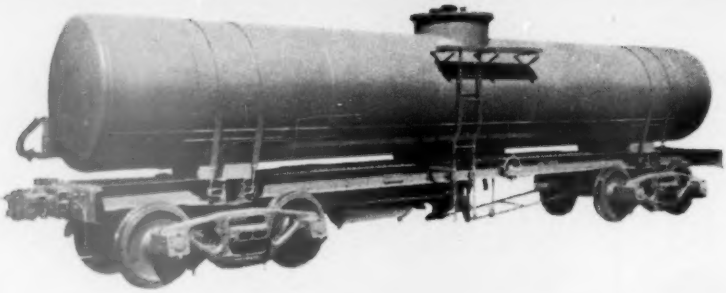

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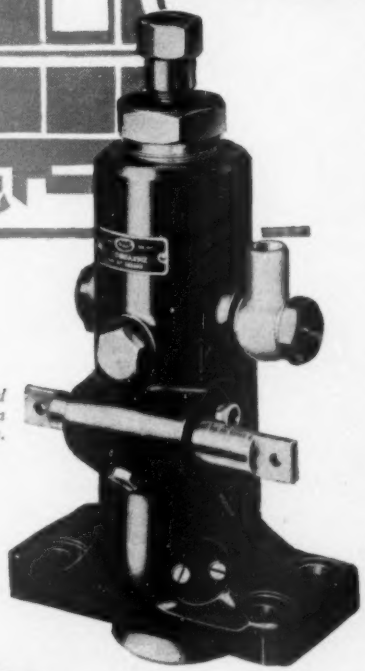
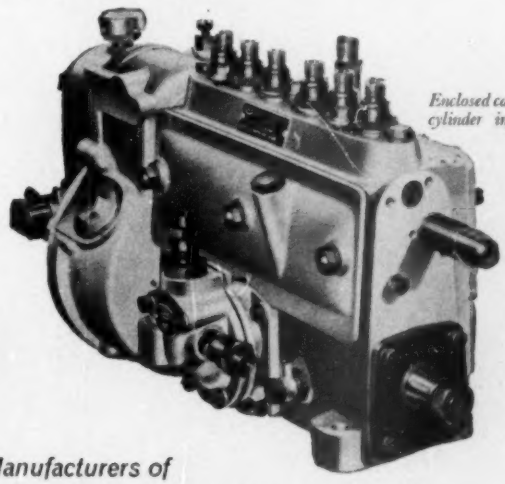


Single flange mounted injection pump for a main line locomotive.



Enclosed camshaft, multi-cylinder injection pump.

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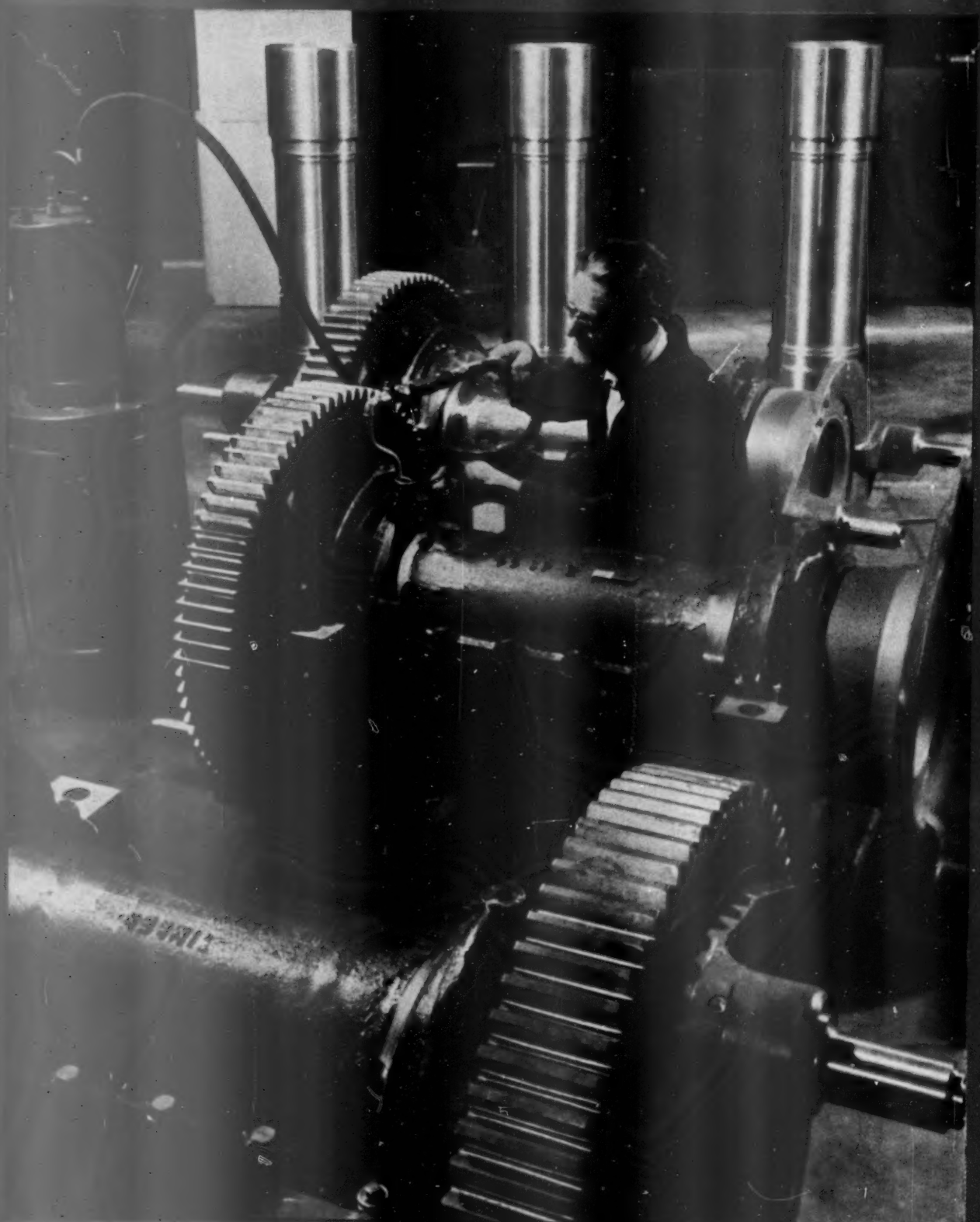

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An international journal of management, engineering and operation

VOL 115 FRIDAY DECEMBER 29 1961 No. 26

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Editor: B. W. C. Cooke, Assoc. Inst. T.

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Railway talent

AN EXTRAORDINARY position has arisen as a result of some comments made by the Minister of Transport during a speech at a meeting of the Commons Standing Committee on the Transport Bill on Friday, December 15. Originally, Mr. Ernest Marples was reported as saying that top railway jobs might not go to the men on the railways because he did not think that the talent was there. He went on to say that the Chairman of the British Transport Commission, Dr. Richard Beeching, had established a method of assessing various abilities and that "a more scientific and energetic approach has been made to the job of making top managerial appointments." The effect that this statement had among British Railway officers can well be imagined, and when the meeting of the Standing Committee was resumed on Wednesday, December 20, Mr. Marples emphasised his concern at what he called the misleading impression given by some Press reports of his speech. After referring to the difficulty of hearing in the committee room, he said that he did not blame the Press on this occasion, because he was convinced it was almost impossible to report accurately because of the acoustics, and the Chairman promised to bring the matter to the attention of the Serjeant-at-Arms in the House of Commons. What Mr. Marples said he had intended to convey was contained in the further statement he made to the Standing Committee that "some key posts are being filled at the present time from outside the industry because British Railways need men now who are already well equipped to carry out certain responsibilities at board level. But that's a very far cry from saying that there is a lack of potential among railwaymen. I am convinced that the potential is there. It is the intention of Dr. Beeching and myself to see that it is given full opportunity." Leaving aside the matter of committee room acoustics, it is no doubt valuable to have this specific assurance at the present time. It would also be of great interest, not alone to railway officers, to know something of the new methods of assessing the managerial abilities of the men at the top of the railway industry.

11 Plus or I.Q. test

IT IS probably unreasonable to suggest that any specific information should be given on a matter of this kind, particularly at present when, obviously, the selection of suitable men to key posts must be of great concern at the highest levels. On the other hand, equally there can be no doubt that many railway officers are wondering whether they are being assessed on a kind of railway 11-Plus examination or a transatlantic type of I.Q. test. There is no sound justification for promotions in either nationalised or free-enterprise industry based solely on seniority, length of service, or similar standards. Nevertheless, it cannot be gainsaid that railways are an industry in which sound technical qualifications in many cases are fundamental in the understanding of administrative problems. There is the further fact that if the right type of young man is to be encouraged to join the ranks of the technical departments of the railways, he must have reasonable grounds for believing that he has a future in the higher echelons of the service, if other things are equal.

Institute of Transport report

THE annual report and accounts of the Institute of Transport were presented at the annual general meeting of Corporate Members on December 18. It was stated that membership has risen during the past twelve months by 275. Approval was given to the formation of a South Australian Section with effect from October 1 last and the council's pleasure at the visit of Mr. R. J. Wylie, Hon. Secretary of the New South Wales section on March 13 was recorded. At the examinations held on May 8, 9 and 10, 1,402 candidates worked papers at 60 centres, and 714 were successful. There were also 47 entries and 26 successful candidates at the internal examinations conducted in Dublin. During the year, one Henry Spurrier Scholarship and six Grants were authorised amounting altogether to £792. The C.M.U.A. Road Transport Research Fellowship was not awarded and will be made available again in 1962 up to the value of £1,000. The Sir William Chamberlain was not awarded and will be available again next year up to the value of £300. The Robert Bell Travelling Scholarship was not available for award. The Reader attended several

conferences, including one at Newcastle-upon-Tyne where he read a paper on the economics of city traffic.

Common Market tariff

THE Board of Trade has prepared an English translation of the common external tariff of the European Community, and this will be published in 11 parts which will be available from H.M. Stationery Office, price 4s. The first part, devoted to machinery, electrical equipment, vehicles, aircraft, vessels, and certain associated transport equipment is already available. It is understood that the text of these translations has not been cleared with the Commission of the European Economic Community nor with the member Governments of the Community and the Board of Trade is solely responsible for them. It is hoped to complete publication of the remaining 10 parts of the tariff by the end of February and the order they will be available in will be: mineral products, chemicals, and pharmaceuticals; fertilisers, dyes, soaps, photographic goods, resins plastics, and rubber; hides, leather, wood, papermaking materials, and paper; textiles; footwear, headgear, umbrellas, etc.; base metals, iron, and steel; copper, nickel, aluminium, magnesium, lead, zinc, tin, tools, implements, and cutlery; optical, photographic, and precision instruments.

Problems of commuter traffic

THE 48th Thomas Hawkesley lecture was presented to the Institution of Mechanical Engineers by Mr. Anthony Bull, Member of the London Transport Executive, on December 13. Mr. Bull pointed out that not only had the increase in private motoring had the effect of reducing the number of people using public transport to get to their place of work but, because of its convenience and relative inexpensiveness once the vehicle has been purchased, taxed, and insured, it had resulted in a substantial fall in the use of public transport in the off-peak hours. In the war-time planning for the railways, it was proposed that improvements should be made to coincide with the redevelopment of Central London and the redistribution of the urban population. Several tube railways of standard design were proposed. Railway improvements carried out or under way were only a small proportion of those then recommended. The metropolitan railway developments in great cities abroad had shown that the needs of daily commuter traffic could not be met by road transport and it was necessary to develop a form of railway system segregated from road and on a different level from the city centre.

Automation takes a step forward

ON November 17, at Erie, Pennsylvania, the General Electric Company demonstrated to the transport industry an automated transit railcar. A spokesman for G.E.C. forecast that, within ten years at least, a dozen of America's largest metropolitan areas will use automated rapid transit on their suburban commutor services. The equipment used in the demonstration coach was based on a decentralised speed-distance regulator concept which was chosen from a number of possible alternatives after evaluation with analog computer simulation. The coach was demonstrated over a test track, making simulated stops, opening and closing its doors, and accelerating to programmed speeds between stations. The speed-distance regulator permits use to be made of the full capabilities of a coach or train. These are limited only by external conditions such as proximity to trains ahead, track speed restrictions, station stops, and dispatching requirements. The regulator analyses this data and produces signals governing propulsion and braking equipment. Fail—safe features are incorporated in the regulating equipment. The system can be incorporated in new stock or used to automate existing coaches. Because of its precise control of traction equipment the system is expected to reduce maintenance and operating costs.

Specification for drawing-office furniture

THE British Standards Institution has published the first of a series of standards for drawing-office furniture. The standard, B.S.3437, deals with equipment for filing drawings. Other standards, which will follow soon, will cover drafting stands; draughtsmen's chairs, and drafting reference tables and benches. B.S.3437 has been divided into four sections; plan chests; vertical filing equipment; lateral filing for small drawings, and roll files for large drawings. The equipment specified is primarily designed to suit the inch series of drawing sizes given in Section 1 of B.S.3429—"Sizes of drawing sheets." It will permit the filing of both the inch series and the international A sizes (A1 to A4), though filing only A sizes would result in some spare space. The B.S.I. intends to review this standard when the demand for the A sizes drawings is sufficiently well established to indicate which particular types of equipment are required by industry. Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 5s. each.

Road—rail co-operation

THAT the British Transport Commission's shares in bus companies were to be transferred to a Holding Company having no connection with the railways whatever was deplored by Mr. John Spencer Wills, Chairman of the East Yorkshire Motor Services Limited, at the annual general meeting on December 20. He pointed out that ever since 1929, when the former London & North Eastern Railway had acquired a financial interest in the company, the policy had been effective co-operation between road and rail. To achieve that end standing joint committees of railway and road transport officers had met regularly and submitted minutes and reports to their respective boards to decide questions of policy without delay. Under the provisions of the Transport Bill now before Parliament, the road-rail partnership, which had existed for so long, was in danger of being destroyed. This seemed to him to be a retrograde step and at variance with the principles of the Bill. Mr. Wills hoped that before the Bill became law the Government would change its mind.

Highside steel wagons for New Zealand Railways

THE Pressed Steel Co. Ltd. has been awarded a contract for 900 " Lc "-class steel highside open wagons by New Zealand Government Railways. Announcing this, Mr. J. K. McAlpine, the Minister of Railways, said that 21 manufacturers in nine countries had tendered for the supply of these wagons and the prices received had been the most competitive in the experience of the Railways Department. The 15-ton capacity " Lc "-class wagons now on order will be of similar design to the 2,300 ordered in 1956, and will have the corrugated ends that give added strength. Mr. McAlpine also said that tenders for the supply of 200 " Kp "-class steel covered goods wagons were being examined, and that tenders were about to be invited for a further 100 " Vs "-class bogie insulated wagons and for 100 steel-sheathed bogie covered goods wagons. The latter, a new design, would be an enlarged version of the " Kp," and would have double the capacity with wide doorways for the handling of palletised loads. These bogie wagons would be suitable for use on express goods trains.

Uganda Railways diamond jubilee

ON December 20, 1901, the railway line from Mombasa reached Port Florence (now Kisumu) on Lake Victoria. This 582-mile line had taken 5½ years to build and was an epic of railway construction probably without equal in the history of the world's railways. All work had to be done by hand with imported Indian labour, and the first stretch of line had to be built over the waterless Taru Desert followed by negotiation

of the Rift Valley escarpment, a climb to 8,000 ft., a drop of 2,000 ft., and a further climb of 5,000 ft. The most spectacular part of the construction story concerns the man-eating lions of Tsavo, who succeeded in bringing work to a standstill for some three weeks at the end of 1898. They are said to have killed and eaten 28 Indian coolies and scores of Africans. In May, 1899, the railway reached Nairobi, 330 miles in three years, a remarkable effort considering the working conditions.

Automatic check-out

THE problem of checking the departure of the last vehicle of a train from a block or yard is an essential requirement of accurate signalling. The S.T.I.N. system described on page 747 is in use on the Malayan Railway, where the automatic couplings which are standard on that system greatly facilitate their installation. A possible application of the automatic check-out is in conjunction with a token system to give a positive indication to the station staff of the arrival of a train. With any up-to-date tokenless block system the S.T.I.N. check-out device allows the system to be converted to an automatic block. In some cases intermediate blockposts can be obtained, or train-controlled automatic crossing-loops can become automatic block stations when through-switched, without track-circuiting the sections.

Training a railway civil engineer

THE introductory notes circulated in connection with a recent informal discussion held by the Institution of Civil Engineers (December 7) on the appropriate training for a railway civil engineer suggest that the ensuing debate may have been animated to a degree unusual in that august company. Clearly chosen to represent not only differences in Regional approach, but also to show the viewpoints of the highest, middle, and lower echelons of railway civil engineering, the three authors were Mr. A. H. Cantrell, Chief Civil Engineer, Southern Region; Mr. Sidney Stevens, District Engineer, Western Region; and Mr. Harry Mallinson, North Eastern Region.

Mr. Cantrell stressed the great responsibilities attaching to the senior engineer—" the responsibility for safety of traffic is so great that part of the graduate's time must be in a very junior capacity although he should learn quickly and soon take on more important work." Mr.Cantrell was rather cagey about exactly how quickly more important work should be undertaken—" the modern trend to qualify as soon as possible is wrong as a slower and more thorough training can in the end prove more valuable." He outlined the three types of training at present in use on British Railways: for university graduates there is a practical course, officially stated to be for a period of two (but often extending to three) years; for non-graduates without technical training there is a much longer course which is begun soon after leaving school—time off with pay is given so that college can be attended once a week during the two winter terms—and there is the sandwich scheme, under which a candidate spends alternate years on the railway and at a college studying for a University degree. Mr. Cantrell thought that District training was very important—it developed a " traffic " sense which, though not in itself of assistance in obtaining an engineering qualification, was a basic asset. Also very important to the railway civil engineer were a thoroughly all-round knowledge of every branch of work in the department and the ability to work closely with the men outside: " He must learn how to lead them, to understand their problems, and to earn their respect."

Like Mr. Cantrell, Mr. Stevens emphasised the need for practical training to cover all major aspects of the work and stressed the fundamental importance in engineering planning of human relations. He added that the embryo engineer must realise that he was not merely learning to become a form of skilled artisan with the main object of earning money, but was setting out to make himself a proficient member of the profession of engineering. " The essential core of a Profession is Service." Mr. Stevens believed that emphasis should be placed on neat and legible drawings, including printing: the student should also learn to spell and to express himself clearly and succinctly in writing. Theory was best learned through a Degree course taken full-time at a University—the social and other aspects of University life were a very desirable field in which a young man's development might take place in an atmosphere which tended to give a perspective background against which he could focus his specialist knowledge. He should learn to use his mind in discussion. Mr. Stevens thought that an active part in the social aspects of each office in which the student served would develop his confidence and his ability to work with, and to know, people.

Mr. Mallinson divided the problem of training into three distinct aspects: learning facts; learning a technique associated with certain facts, and developing confidence in one's own personal judgment. He thought that the term " experience " was often misunderstood—as he defined the word, experience consisted of being placed in a position of responsibility such that a person was obliged to take certain decisions, the net result of which was that the individual acquired personal confidence in his own judgment. Experience without responsibility was of doubtful value—the young engineer should be given the opportunity to shoulder responsibility at the earliest possible stage in his career. At the same time, he must be aware that if he made mistakes he would be held responsible. At this point, one cannot help thinking of Mr. Cantrell's emphasis on the responsibility of the railway civil engineer for safety of traffic—it might also be thought that if through inexperience one had been responsible for an accident, one's personal confidence—far from soaring—would drop to an all-time low, as the Americans put it.

Mr. Mallinson also considered that the present system—or rather, lack of one—under which a student must find out for himself " facts concerning the various complicated administrative procedures that have to be complied with on the railways " was time-wasting and " hopelessly inefficient." But is it? While one may cautiously agree that information may be selfishly withheld, or not be available because it is not known, or given in an incoherent form, or even inaccurately, might it not be that the *nous* for finding and fostering the right person to give the information is the hallmark of a man destined to make good as a civil engineer? Mr. Mallinson would like a full-time course to be arranged to impart knowledge on, among other " indisputable facts," the " regulations, rules, and Acts of Parliament governing the workings of British Railways." Yet what could this be but a cramming session, quickly assimilated by a certain type of mind perhaps, yet as quickly forgotten if the knowledge were not soon used—and this could very easily be. It is a little unlikely that, during his two to three years of training, a student would come up against the application of every regulation, rule, and Act of Parliament in force on British Railways.

Mr. Mallinson thought that emphasis on draughtsmanship and printing was often over-emphasised by many senior members of the profession. It was obviously necessary to be able to translate one's ideas on paper in an economical and easily-understood form but, while immaculate printing was a desirable asset in a young engineer, it was not a necessity. He did not consider that the student benefited by continually moving between offices—he could be made to feel that he was either a nuisance or a mere onlooker, and this type of training caused disorganisation in the various offices visited. If depth of experience were desirable, the period of training should be extended. The content of a training scheme should not be set—training should be spread over a number of years and the higher the position aimed for, the longer that period should be. What was required was not a radical change in the present content of the training programme, but a more enlightened attitude among those whose concern it was to implement it.

The refreshment vehicle

WE referred in a recent issue (November 24, page 588) to the success of the work undertaken by British Railways engineers in improving the ride of high-speed passenger coaches, a feature of particular importance on restaurant car vehicles. A valuable review of the whole problem of vehicle design for providing meals on trains, ranging from beverages and snacks to a full meal service of hotel standard for 240 people at one sitting, has been presented to the Institution of Locomotive Engineers as a Symposium on the engineering aspect of catering on trains. This review is in the form of three papers, "The vehicle from the catering manager's viewpoint," by Mr. H. Simons, British Transport Hotels; "British Railways experience," by Mr. H. Wilcock, British Transport Commission, and "Overseas experience (East African Railways & Harbours)," by Mr. W. E. Bulman, Chief Mechanical Engineer.

In the streamlining of the ideal vehicle types required to meet economically the wide variation in public catering demands, British Railways have selected six basic types, viz.: the kitchen car; kitchen buffet; restaurant buffet; restaurant unclassed; miniature buffet, and griddle car.

In the selection and design of this range of vehicles, the authors freely acknowledge the co-operation of designers, management, staff, and equipment manufacturers. Good catering amenities and service rank high in promoting good customer relationships and are important factors in the "selling" of rail transport.

The largest catering vehicle, the kitchen car, occupies a full coach, having an effective floor space of about 400 sq. ft. Provision is made in this for the preparation of meals for 240 passengers at one sitting, the car being provisioned for serving 500 meals in one day. As well as for consumables, permanent storage is required for 1,250 plates, 250 teapots, cups and saucers, 250 coffee cups and saucers, 2,500 pieces of cutlery and a quantity of silver tableware.

On certain routes and services there is a substantial demand for both *table d'hote* meals and light refreshments, a requirement which has been met by reducing the size of the kitchen and including a standing buffet. This has proved popular both with long-distance passengers between main meals and has attracted new business from passengers not requiring the full meal service. From a kitchen area of 93 sq. ft., this car can serve up to 100 meals into two saloons simultaneously.

In the restaurant car unclassed, a dining saloon with seating accommodation for 33 passengers is provided, while in the restaurant buffet car the saloon seating is reduced to 23 to provide room for the standing buffet. The miniature buffet is an open second class vehicle in which the area of 20 seats is occupied by a standing buffet. Staffed by one man to provide beverages and freshly-prepared snacks, this vehicle is used for multiple-unit diesel services and to supplement a full restaurant car service on main-line trains. The latest development is the griddle car, an attractive and efficient vehicle having a combined kitchen and buffet in the centre with a 12-seat buffet saloon at one end and a comfortable 16-seat bar saloon at the other.

This seating is arranged facing inward along the coach sides and bar service is from an attractive display counter in the corner. A range of low cost dishes are prepared on the "cook-as-you-watch" griddle and this service plus the comfortable saloon bar is an excellent example of British Transport Hotels initiative. Separate staff accommodation is provided on all catering vehicles, except in the case of the miniature buffet car.

Within the general framework of traffic routes and operation these six types of vehicle will satisfactorily meet the basic catering demands, but considerable flexibility is required from both staff and vehicle to meet peak demands such as summer weekends, booked parties, and football supporters. The type of vehicle selected for a particular train is important since operating results depend largely on the relation between gross receipts and staff costs. Working and storage space are severely limited and, in the design and mock-up stages, working conditions are simulated to secure maximum use of space and optimum location of stores and equipment. This study also includes the loading problem, which on some services requires the daily manhandling of 30 cases and crates which may total a ton in weight.

To secure maximum route availability, all catering vehicles with the exception of Southern Region multiple-units conform to British Railways C.1. loading gauge. This limits body width to 9 ft. and roof height to 12 ft. 4½ in. Route restrictions limit the width of Southern Region vehicles to 8 ft. The comparable dimensions of the Continental loading gauge used for catering vehicles in Europe are a body width of 10 ft. 4 in., and a roof height of 14 ft. 10 in. The standard coach underframe has proved to be particularly suitable for mounting the additional equipment required for catering vehicles, with due regard to obtaining an equally distributed load. Reference has already been made to the improved riding obtained with the Commonwealth and new B.R. bogies but, even with this equipment, bad driving and non-observance of speed regulations can create unnecessary kitchen hazards by splashing hot liquids and cause discomfort to the diners. Breakages of glassware and crockery amount to several thousand pounds each year.

All possible types of fuel for cooking and boiling water have been tested and the use of low-pressure propane gas, pioneered by British Railways, has been standardised. This is carried in liquid form in banks of cylinders mounted on the underframe, each cylinder containing 220 cu. ft. of gas.

The papers are well illustrated and details are given on important aspects such as ventilation, hygiene, security, lighting, and refrigeration. East African Railways operates a number of restaurant and auxiliary cars and has recently introduced buffet car facilities by converting standard coaches. Various types of fuel have been tried, including wood, oil, and anthracite, the latter being preferred for these operating conditions. On some routes refrigeration is provided by wet ice-insulated boxes, and on others by electricity or paraffin. Buffet facilities are also included in coaches for East African Railways now being built by the Gloucester Railway Carriage & Wagon Co. Ltd.

The downward trend in railway revenue

BY A CORRESPONDENT

THE eleventh 4-week period of the year, covering about three weeks in October and one in November, used to be a time of heavy wagon loadings on British Railways. In these four weeks of 1953, 23,791,000 tons of freight train traffic were originated. This year, forwardings dropped by 5,104,000

	Four weeks to		Incr. or Decr.	Aggregate for 48 weeks to		Incr. or Decr.
	Dec. 3 1961	Dec. 4 1960		Dec. 3 1961	Dec. 4 1960	
	1961 £000	1960 £000	£000	1961 £000	1960 £000	£000
Passengers—						
British Railways	10,108	9,587	+ 521	145,347	139,226	+ 6,121
London Transport—						
Road Passenger Services	4,599	4,386	+ 213	54,775	52,427	+ 2,348
Railways	2,267	2,154	+ 113	26,190	24,161	+ 2,029
Provincial & Scottish Buses	4,678	4,437	+ 241	61,109	57,480	+ 3,629
Ships	193	182	+ 11	7,547	7,049	+ 498
Total passengers ...	21,845	20,746	+ 1,099	294,968	280,343	+ 14,625
Freight, Parcels & Mails—						
British Railways—						
*Merchandise & livestock	8,505	8,639	− 134	93,733	94,631	− 898
*Minerals, etc.	3,300	3,971	− 671	40,404	45,225	− 4,821
*Coal & coke	8,916	9,430	− 514	96,864	100,323	− 3,459
*Parcels, etc., by coaching train	4,791	4,605	+ 186	52,779	51,963	+ 816
†Others	5,008	5,023	− 15	58,938	55,263	+ 3,675
Total freight, parcels & mails	30,520	31 668	− 1,148	342,718	347,405	− 4,687
Total ..	52,365	52,414	− 49	637,686	627,748	+ 9,938

* Includes receipts from collection and delivery, etc.
† Receipts from railway movements wholly within dock areas, included in previous periods under "Freight, Parcels and Mails," are now classified as miscellaneous

or 21 per cent, to 18,487,000 tons. The outcome was that 25 per cent fewer ton-miles were worked than in 1953 and £2,153,000 less freight revenue was earned than in 1961, a drop of nearly 10 per cent.

In four weeks to December 3, there was a further fall in freight receipts of £1,139,000, or about 6 per cent, bringing the total loss from 1960 over 48 weeks of 1961 to almost £9 million, close on 4 per cent. The trend of operating expenses is always doubtful but is probably upward. So it looks as though a critical stage in the history of British Railways as general freight carriers may arise as it has already done in the case of some American railways.

Meantime, railway passenger takings in nine months to September were £4,626,000, or nearly 4 per cent, above 1960, because the first class fare was higher by 16·5 pence and the second class fare by 1·6 pence. The cost of providing passenger services is bound to be high and any surplus that is left cannot offset the loss of profit from freight traffic movement as it did in the past.

PERCENTAGE VARIATION, 1961 COMPARED WITH 1960

	Four weeks to Dec. 3	44 weeks to Dec. 3
British Railways—		
Passengers	+ 5.4	+ 4.3
Parcels	+ 4.0	+ 1.5
Merchandise & livestock	− 1.5	− 0.9
Minerals	− 16.9	− 10.6
Coal & Coke	− 5.4	− 3.4
Total	− 1.1	− 0.5
Ships (passengers)	+ 6.0	+ 7.0
British Road Services inland waterways and ships (cargo)	− 0.2	+ 6.6
Road Passenger Transport, Provincial and Scottish	+ 5.4	+ 6.3
London Transport—		
Railways	+ 5.2	+ 8.3
Road Services	+ 4.8	+ 4.4
Total	+ 4.9	+ 9.1
Aggregate	—	+ 1.5

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

RAILWAYS AND THE CLERGY

December 7

SIR, A Cheshire vicar who was well known as a railway enthusiast made a habit of travelling every Saturday from Chester (Northgate) to Manchester (Central) and back with the alleged object of getting inspiration for his Sunday sermon, when travelling along that most attractive line through Delamere Forest. On arrival in Manchester he lunched well in the then excellent Central Station restaurant, returning to Chester by the same route, but this time with the compartment blinds drawn. It was also reported that the vicar disbursed largesse to the train guard for locking the door, strictly against the C.L.C. regulations.

I never had the opportunity of listening to the vicar's sermon on the Sunday following his railway excursions, although on the subsequent Monday morning I found on my office desk at Liverpool (Central) a foolscap sheet listing railway shortcomings, all of which required considerable ingenuity and patience to fathom.

Yours faithfully,

G. LEEDHAM
Formerly Secretary & Manager, Cheshire Lines Committee

Reform Club,
Pall Mall, S.W.1

THE U.S.A. RAILWAY POSITION

December 9

SIR, On December 1, you published an article showing the results of eight months of U.S.A. railroading. Five days later *The Times* reported that a gathering of industrialists at Chicago took an optimistic view of U.S.A. trade prospects in 1962 and thought that the railways would make a better showing in the first half of next year than they did in 1961, though record levels of 1960 were not likely to be attained.

Actually, 1960 traffic volumes were poor, with earnings declining for the fifth consecutive year to the lowest amount since 1938. Net income of $445 million was 23 per cent less than in 1959 and over 50 per cent below the 1955 figure. The A.A.R. statement of incomes and expenses to September 30, shows 23 railways in deficit, against 19 a year ago. The New Haven, working dwindling traffics at a ratio of 98·5 per cent is in a hopeless plight, with a deficit of $17 million. The Erie-Lachmawanna deficit rose from $5·4 million last year to $16·6 million; the merger of the two railways in October, 1960, so far has been a complete failure, the present operating ratio being 93 per cent. The New York Central, operating at 87·5 per cent, had earnings of nearly $10 million in September 1960, but now records a deficit of $13·5 million, while the Baltimore & Ohio is $14 million on the wrong side of its account. The Pennsylvania has held down its deficit to $3 million, but its operating ratio of 85 per cent compares with the Norfolk & Western ratio of 58·4 per cent, which leaves that great coal road with a net railway operating income of $44·8 million, about $5 million less than it enjoyed a year ago.

The financial status of the Norfolk & Western is unique. For most of the American railways, 1962 will be a troublesome year, especially for lines which cannot keep their operating ratio below 83 per cent.

Yours faithfully,

YOUR CORRESPONDENT

Westminster, S.W.1

RAILWAYS INTO ROADS

December 11

SIR, Brigadier Lloyd is to be congratulated on his brilliant mathematical jugglery contained in your issue of December 8. He must have spent many happy hours manipulating reams of statistics, and it must have been a moment of great joy when he finally managed to bully them into giving the result $\frac{\text{rail}}{\text{road}} = \frac{10}{7}$.

Even he had to make certain vague assumptions, presumably ensuring that the benefit of the doubt went the appropriate way. The weakness of his argument is that he has considered only the number of people using the roads and railways, and has ignored the distances travelled. A man cycling half a mile to work is therefore considered to have "exposed himself" just as much as anyone making the daytime journey from Kings Cross to Aberdeen, though anyone making the same journey by night would, I suppose, be considered as "doubly exposed," having travelled on two separate days.

If Brigadier Lloyd wishes to make a more direct comparison between road and rail I suggest that he sets his little pile of M.1 statistics against those for the main railway between Watford Junction and Rugby Midland.

I will now make a simple calculation, treating the M.1 in exactly the same way as Brigadier Lloyd has treated the railways in his calculations.

I believe that in 1960 there were 24 deaths on the M.1 and 241 accidents of all descriptions. Since pile-ups are very

common I don't think it is unreasonable to assume that at least 350 people were injured (Brigadier Lloyd could probably give a more accurate figure). I don't think that on an average day more than 25,000 people ($\frac{1}{2000}$ of the total population) travel along the M.1. Therefore, if all roads were as lethal as the M.1, the number of people killed in road accidents each year would be 24 x 2,000 = 48,000, and the number injured would be 350 x 2,000 = 700,000.

The M.1 is supposed to be our safest road, but presumably Brigadier Lloyd does not agree on that point.

Yours faithfully,

D. OSMAN

7, Warren Street,
Alvaston, Derby

December 18

SIR, I am quite unrepentant. The facts in my letter (published on November 17) are correct. In making a survey of people travelling between suburbs and central London, Ministry of Transport officials can be trusted not to count twice over. The Underground total is for travel over the suburban lines of London Transport's railways with ramifications, mostly on the surface, as far afield as Wimbledon, Uxbridge, Ruislip, Amersham, Watford Jcn., High Barnet, Cockfosters, Ongar, and Upminster. In the peak 15 minutes in 1956 rates of 271,600 per hour were reached by British Railways, and 362,800 by London Transport railways, giving a total of 634,400 per hour. New diesel and electric trains have brought the total to around 640,000 per hour by railway-train in 1961. We may be excused for not realising that conversionists allow exceptions, and admit that the frequency of trains on London Transport railways is something that cannot be matched by road. We thought they wanted a road from Amersham to Baker Street or from Hounslow to Charing Cross, especially as one writer actually mentioned the District Line by name. In 1956, London Transport carried the 362,800 per hour over 36 lines of way; the 28 main roads (say 112 lines of way) only carried 117,600 per hour.

Removal of station platforms and consequent destruction of the buildings would result in loss of amenity; it would be down to street corner conditions, and to something else too where the platforms are cantilevered on banks and bridges. Pulling in and out of lay-bys adds an extra hazard.

I did not say that the average load of British railways freight trains is 300 tons. I stated quite clearly that 12 15-ton lorries could not substitute for a train with average loading of 300 tons. If Mr. Douglass wants to ponder averages let him note that, while the average loading of B.R. freight trains may be 152 tons, the average loading of British lorries is less than five tons.

Mr. Douglass has discovered that there are more B.R. staff than actual train crews; we knew that already. Road transport also needs more than drivers. In England and Wales in 1960, £138,118,000 was spent on road maintenance and construction, a total which presumably includes some man-hours put in by Local Authority engineers and their staffs; likewise £960 million was spent on new investment in vehicles (the railways build their own), and £12,650,000 on police and traffic control. There are also filling and service station staffs, garage hands, patrols, traffic wardens, car park attendants, sorters of parcels traffic, etc., together with supporting clerks and accountants, and the people behind the scenes in the hauliers and passenger operators' businesses. The retinue behind road scenes is at least as large as that of the railways and essential to keep the wheels turning. When all is said and done the alleged average train (152 tons) needs three men for a crew, and one average lorry-load (<5 tons) needs one man, which gives a comparison of three men (rail) to >31 men (road) for the same job.

I travelled over the G.C. line regularly at about once a week at one period. The facts in my letter are correct. Mondays to Fridays there are seven commuter arrivals at Marylebone between 7.50 and 8.51, and there are no waits for 20 minutes at Woodford Halse. The boys who collect engine numbers at Rugby bear out my contention that there are freight trains on the Leicester-Woodford section at about 30-min. intervals throughout the day both ways. Whatever precedents there may be, the Ministry of Transport has quite definite regulations about hard shoulders and central reserves for motorways, without which there cannot be unlimited vehicle speed for lorries and public service coaches.

Mr. Marples at least is worried about the accident rate on the roads. The lawyers will find Brigadier Lloyd's reference to "accidental suicides" intriguing, but his summing up is masterly. "The basic consideration is that the highways menace 25 times as many people as British Railways" (he curiously omits the 3,266,926,000 annual travellers on London Transport railways). By simply dividing the number of people killed in railway accidents (37) into the total killed in road accidents (6,322) in 1960 I had already formed the opinion that the roads menace 173 times as many people as the railways.

Yours faithfully,

R. G. R. CALVERT

45, Woodwaye,
Oxhey, Hertfordshire

December 4

SIR, As a railway engineer with 46 years of experience behind me, I suggest that Mr. W. D. Mitchell, who thinks the conversion of the Great Central line into a road a very simple matter as it is never less than double track, reflects carefully on the paragraph in Mr. R. T. Munn's letter dealing with the cost of conversion and beginning, "Apart from the width of the Up and Down tracks. . . ."

These are the operative words. While "railways into roads" advocates equate a double-line railway to a double line of road traffic they are, literally, on safe ground.

Outside this narrow width—about 20 ft.—they are, on embankments, in railway parlance "off the road," i.e., outside the area which is suitable for supporting either rail or road traffic loads.

No doubt this has been pointed out before in this controversy. From the engineering point of view there is nothing impracticable in conversion but the question of cost (quite apart from operating feasibility) should not be glossed over or confused by drawing general conclusions from the few stretches of railway which have already been converted into roads.

Yours faithfully,

R. E. COWARD

23, Manchester Street,
London, W.1

December 12

SIR, Brigadier T. I. Lloyd's method of arriving at the numbers of people daily exposed to danger on rail and road respectively, though ingenious, seems to be unfairly biased against the railways.

If all the population, 50 million, is considered to be in daily danger or otherwise on its use of the roads, even though many may merely walk to their work or to the corner shop, then surely one must, on the other hand, consider those of the population which have any kind of movement relationship with the railways. This will include all who use under or over bridges (as the railways have provided such crossing facilities to make it safer for people to cross), and all of those who use level crossings. This would bring at least half of the population into the category of users of railway facilities.

Yours faithfully,

E. R. SANDERSON

Larch Rising, Quarry Road,
Oxted, Surrey

[This correspondence is now closed.—ED. *R.G.*]

The Scrap Heap

Round the bend

The sharp curves that exist on the upper section of the Cromford & High Peak Railway preclude the use of any but four-wheel rolling-stock, so that would-be visitors have to travel in open wagons or brakevans. Illustrated on this page is a special train organised by the Stephenson Locomotive Society earlier this year. On its way from Parsley Hay to Middleton Top, the train is rounding the sharpest of the curves.

Enthusiasts' trip on the Cromford & High Peak Railway, Derbyshire

No

"I regret that in the circumstances I am unable to alter my decision in this particular case and can only respectfully maintain declinature of your claim." Letter from British Railways to the managing director of a Lancashire ironworks. —*From "The Daily Telegraph."*

Snake-pit

Lewis Mumford, the well-known authority on urban and regional development, in an article in the *New Yorker* magazine, hit out at Britain for its failure to profit from United States mistakes in transport. "Britain," he said, "has lately brought forth a new society dedicated to the perverse object of wiping out the nation's railway system and bringing both people and goods into London by bus and truck. Apparently only the blind and the halt fully qualify as traffic experts. Somewhere I've seen the U.S. highway network related to the famous Greek statue of Laocoon—the old fellow and his sons being squeezed to death by some big snakes. A perfect representation of almost any large U.S. city today—and more serpents on the job every time you look."

METROPOLITAN LINE MODERNISATION

Steel bridge at Northwood which replaces old brick arches

Tenpin money?

In an attempt to brighten the workaday atmosphere of the New York underground railways, plans have been adopted by the New York transport authorities allowing the Subway Bowling Company to build and operate 76 bowling alleys in three stations of one of the underground lines. The company will pay to the authority 12 per cent of the gross receipts of the alleys for 20 years, and hopes to obtain a licence to sell beer.—*From the "Victorian Railways News Letter."*

Wrong gang

"Suspicious characters" reported leaving Bagshot Station by car recently, were rail gangers going home to bed after night work.—*From "The Evening News."*

Camden Round House

For 90 years the old Round House of the London & North Western Railway at Camden Town has been a bonded warehouse for W. & A. Gilbey, Limited, the wine and spirit merchants. It was built in 1847 as a locomotive shed. In the 1860s the firm moved from Soho to Camden Town to premises owned by the railway. The old round house was taken over in 1871. It is scheduled as a "building of architectural or historical merit."

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

DENMARK

Rail and car ferry

Plans have been announced in Copenhagen for a rail and car ferry connection between Hull or Harwich and Esbjerg, Denmark, using the ferry vessel *City of New Orleans*, which formerly operated between Havana and Florida. A spokesman for the Danish company which hopes to sell the 5,593-ton vessel to either the British or Danish railways, said that preliminary discussions on the project had already taken place between railway officials of both countries. British Railways said that they could not commit themselves beyond evincing interest in this project until they are satisfied as to the need (if any) for the proposed service and its practicability.

WESTERN GERMANY

Federal Railway orders

The German Federal Railways is proposing to place orders worth DM.109 million with West Berlin companies during 1962. This is to be done under a credit-financed supplementary programme designed to support West Berlin industry. The programme for 1961 amounted to DM.100 million and covered the purchase of passenger coaches, electric railcars, freight wagons, and electrical equipment.

NORWAY

Arctic railway

The construction of the railway line linking the Norwegian port of Bodoe with Norway's main railway system has been completed. The official opening of the railway will not take place till June, 1962.

HUNGARY

Production of concrete sleepers

The manufacture of concrete railway sleepers and complete factories for their production has been assigned to Hungary by the Council for Mutual Economic Aid. Russia, Czechoslovakia and Bulgaria are the first customers.

INDIA

New oil industry

The first consignment of crude oil, 100 tons in weight, from the Ankleshwar oilfields being developed in Gujarat State was carried by the Western Railway to the Burmah Shell refinery in Bombay. In Gujarat, six oil-bearing structures have been located and three have been explored. In all, 35 wells have been bored, of which 31 have yielded oil. A refinery is being established in that State, but is not yet in service.

Record movements of coal

In August, 1961, daily average coal loading in the West Bengal and Bihar coalfields totalled 5,102 wagons, a record quantity. Of this number, 2,106 wagons was destined for stations to the north-west of Moghalsarai. Of the total of 158,162 wagon-loads railed from the pits during the month, 120,962 moved over the Eastern Railway, the remaining 37,200 wagons passing over South-Eastern Railway metals.

CHINA

Suburban service

One innovation in a plan to speed up Peking suburban services is the introduction of a diesel multiple-unit train with an all-woman crew. Called "East Wind," it has four double-deck coaches and two power coaches.

WESTERN AUSTRALIA

Midland Railway Company results

The approximate railway and road service gross receipts of the Midland Railway Company of Western Australia Limited for the month of September are £A.109,934, an increase of £A.8,303 on the same period in 1960. The gross receipts for the three months July/September, 1961, are £A.328,500, an increase of £A.63,356.

VICTORIA

Extra trains for Empire Games

Extra trains are scheduled to run in Victoria in November and December next year for spectators attending the seventh Empire Games. The trains will run from Melbourne to Perth. Advance bookings which opened in July have been subject to a steady demand.

Bulk flour consignments

Victorian Railways is handling bulk flour consignments in a specially-designed

STATION RECONSTRUCTION IN NEW ZEALAND

Reconstructed station building at Patea, near Wanganui, North Island

wagon with two compartments, each holding 15 tons. Until the introduction of this equipment, all flour carried by this system was bagged.

NEW ZEALAND

Underground railway in Auckland

Mr. A. W. Egan, District Traffic Manager, New Zealand Government Railways, stated recently that an underground system was essential if Auckland was to develop as planned, and added that Auckland Station had been built with through-platforms so that passengers could travel within the city by underground railway.

Westfield Marshalling Yard

On January 7, 1962, the marshalling yard at Westfield, North Island, will come into operation. More than a mile long and covering 30 acres, some 20 of which have been reclaimed from Manukau harbour, the yard has 14 miles of track and can accommodate 1,900 wagons. It is to be used as a clearing point for all wagon movements in the Auckland area.

UNITED STATES

Fast freight trains

The Illinois Central Railroad has announced a new freight train service between Chicago and New Orleans on a fast schedule. The service results in the introduction of two trains, CN-7 from Chicago and NC-8 from New Orleans. Both trains will cover the 921-mile run in 28 hr., which is 3½ hr. better than the present timing.

MEXICO

Foreign purchases

Mexican National Railways continued to draw on the Eximbank loan for the supply of railway equipment and purchased 55 diesel locomotives during the third quarter of the year. Mr. Mendez, the General Manager, has been to Canada to negotiate the purchase of 30,000 tons of rails, representing four years' supply, at a cost of about U.S. $50 million.

In Brief

Denmark. Danish State Railways has received the first of 17 motor coaches and three of 17 trailer coaches ordered from Scandia A.S. for the Copenhagen electric services.

Kenya. Three tank wagons are to be purchased for the carriage of cement from Mombasa to Nairobi at a cost of £30,000. Each wagon will have a capacity of 60 tons.

Pakistan. Under a trade agreement concluded in September, Pakistan is to import wooden sleepers from the Philippines.

Poland. During 1962 the Swindnica rolling-stock factory is to produce wagons for the Soviet Union with a capacity of 100 tons.

U.S.S.R. It is expected that by 1970 the U.S.S.R. will have 40,200 km. of line electrified: 9,000 km. has been electrified during the past five years.

TRAINING APPRENTICES IN EAST AFRICA

A group of apprentices under instruction in the Chief Mechanical Engineer's Workshops at Nairobi, East African Railways & Harbours

PUBLICATIONS RECEIVED

Weldirectory of Lincoln Arc Welding Equipment, Electrodes, and Accessories. A new edition of its catalogue has been produced by the Lincoln Electric Co. Ltd. A loose-leaf publication, it is designed to receive additional information sheets and provide an up-to-date reference on the company's complete welding service to industry. It contains ten indexed sections in a cloth-bound ring-type binder. Copies are available on request from the Publicity Department, Lincoln Electric Co. Ltd., Welwyn Garden City, Hertfordshire.

Jahrbuch des Eisenbahnwesens. 12th edition. Published by Professor Dr.-Ing. Th. Vogel, President of the Railway Central Authority, Munich. Editor, Dr. Jur. E. Kadenbach. 11½ in. x 8 in., 244 pp., illustrated. This review deals in detail with German, Austrian, and Swiss railway developments. Articles on Swiss railway electrification on developments in bridge building, and on the reform of goods charges on the Austrian railways exemplify the range covered. The articles are well illustrated with half-tone and colour photographs, graphs, and diagrams, some of which are particularly well prepared. Of especial interest is an article on gas turbine generation of electricity in a rail-borne mobile power station for Mexico, by Mr. Werner Hunziger and Mr. Martin Frick of the Brown Boveri Company.

The Cellobond polyester story. Published by British Resin Products Limited, the introductory section in this booklet deals with the manufacture, properties and use of Cellobond polyester resins. The main text shows how the needs of nine major industries are being met by the special properties of polyester/glass—high strength/weight ratio, and resistance to chemicals and weathering. A variety of railway applications is featured ranging from carriage doors to ceilings, canopies and air ducting.

Welding Aluminium. Published by Alcan Industries Limited, this booklet is a revision of a booklet of the same title issued last in 1958. Like its predecessors, this edition makes special reference to arc-shrouded processes—tungsten-inert gas (T.I.G.), and metal-inert gas (M.I.G.)—and the tables of procedure which occupy half the 48 pages of the book apply to these methods. Space has also been given to a description of other welding processes such as metallic-arc, resistance, ultrasonic, gas, and pressure welding, as well as brazing and tungsten-arc cutting.

Steel castings specifications. A publication No. 466S, by Hadfillas Limited, East Hecla Works, Sheffield, includes tables showing current British and American standard specifications for steel castings. A selection of European castings specifications, similar to the carbon steel specification of B.S. 3100, is also given.

Deloro stellite service. A pamphlet setting out the uses of stellite alloys in a variety of ways. Among others, there are illustrations showing the material being used in eliminating switchgear wear problems.

Calendars. We have received calendars from the following: Holman Bros. Ltd.; the Hunslet Engine Co. Ltd.; Chloride Batteries Limited; Crofts (Engineers) Limited.

THE TRACTIVE RESISTANCE of diesel locomotives

Considerations relating to rolling and air resistance data derived from recently-published test results

by J. L. KOFFMAN, *Design Engineer (Projects), Chief Mechanical Engineer's Department, British Railways Central Staff*

THE fundamental considerations relating to the determination of the tractive resistance of locomotives and railcars were dealt with at some length in two previous articles published elsewhere in 1950(1) and in 1959.(2) Because of this, the method adopted to separate the variables and the non-dimensional drag coefficients C_d will not be further repeated here.

Meanwhile, additional experimental data has become available mainly as the result of the broadminded attitude of the British Transport Commission as to the publication of technical information in the form of locomotive performance and efficiency test bulletins.

Tractive resistance

The tractive resistance data which appeared in some of these bulletins is re-plotted in terms of lb. per ton (Fig. 1). It might be recalled (1) that the tractive resistance can be represented by the following equation:

$$R = aW + C_d \times 0{\cdot}26A \times (V/10)^2 \text{ [lb]}$$

where W [t] is the vehicle weight, A [sq. ft.] the projected frontal area, V [m.p.h.] the vehicle speed relative to that of the air, a [lb. per ton] the specific rolling resistance and C_d the dimensionless drag or shape coefficient. The value of a is about 3·5 [lb. per ton] for roller bearings while that of C_d for diesel locomotives varies between 0·6 and 0·9 depending on the shape of the front end and the general locomotive configuration. The analysis of the resistance data relating to B.R. Class "D" Type 800 B-B diesel-hydraulic locomotive (2) suggests $a = 5{\cdot}75$ [lb. per ton] and $C_d = 0{\cdot}55$. The former value is high, probably because of the common drive between the two axles of each bogie. The values of C_d plotted in Fig. 1 are based on assuming $a = 3{\cdot}5$ [lb. per ton], which would appear to be justified for the cases considered here.

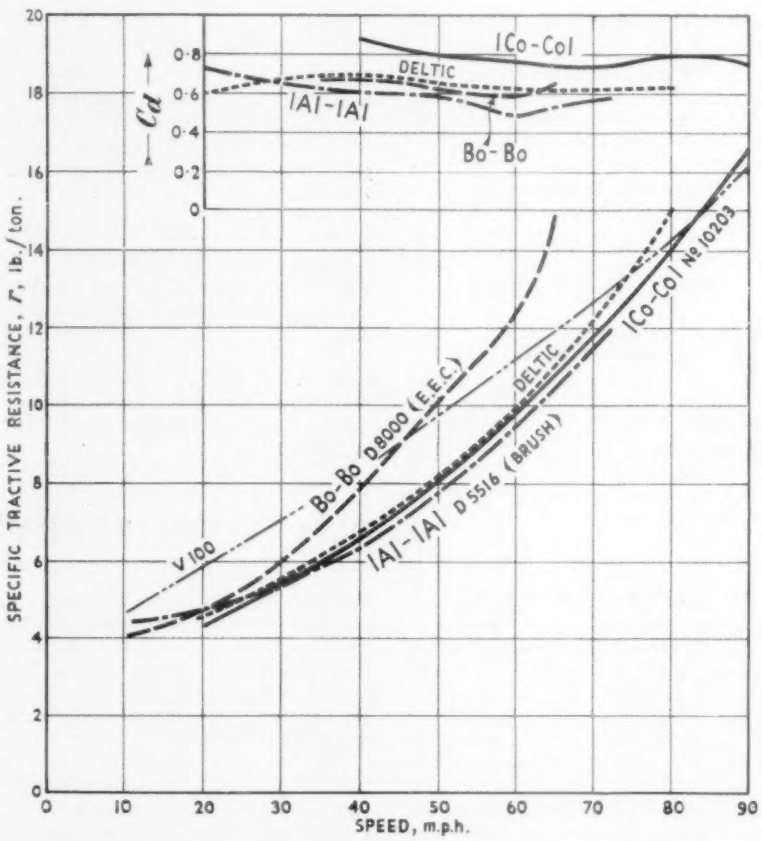


Fig. 1. Specific tractive resistance and drag coefficients of bogie locomotives

It will be noted that, as might be expected when bearing in mind the nature of difficulties faced with road tests of this nature, the resultant values of C_d plotted as a function of speed fluctuate somewhat and that they do not entirely meet the expectations likely to be based on considerations relating to the locomotive configuration. Thus the original Southern Region 1Co-Co1 diesel-electric locomotive No. 10203 with its rather square ends suggests $C_d = 0{\cdot}75$ to 0·8. The smoother, though stepped back at the cab "Deltic" locomotive has a C_d of about 0·62 and both values and their relation to each other appear to be logical and reasonable. The single-cab Bo-Bo diesel-electric locomotive No. D. 8000, with its extensive engine bonnet and consequently aerodynamically rather disjointed superstructure, exhibits a C_d value of about 0·68 falling below 0·6 at 60 m.p.h. and then rising rather steeply at speeds in excess of 60 m.p.h. The smooth 1A1-1A1 Brush-built D. 5516 diesel-electric locomotive with a rather square front end appears to possess a C_d value of about 0·6 although at 60 m.p.h. this works out to as low as 0·5. Finally, the corresponding value for the single-cab B.T.H. Bo-Bo diesel-electric locomotive D. 8200 works out 0·7, which is more in line of what might be expected of a configuration of this aerodynamically somewhat disjointed shape. The resistance data of the D5000 type 2 Bo-Bo diesel-electric locomotive suggests a C_d value of about 0·65 to 0·7.

Analysis of the resistance data contained in the bulletins suggests rolling resistance values of $a = 3{\cdot}5$ to 4 [lb. per ton] and drag coefficients varying between $C_d = 0{\cdot}6$ for well-proportioned locomotives with fairly smooth ends, and $C_d = 0{\cdot}75$ for

more conventional shapes and for single-cab locomotives. Tests with the six-coach Midland Pullman *de-luxe* train suggest a C_d value of about 1·5.

It may be of interest to compare this data with information published in connection with the performance characteristics of some other modern locomotives. Thus, in the case of the Swiss-built Roumanian Co-Co diesel-electric locomotives (3) reference is made to an equation:

$$r = 3{\cdot}5 + 0{\cdot}4\ (A/W)\ [(V+12)/10]^2 \text{ [kg. per tonne]},$$

the constant value of 12 k.p.h. probably being added to allow for headwind. For the complete locomotive this reads:

$$R = 3{\cdot}5W + 0{\cdot}4A[(V+12)/10]^2 \text{[kg.]}$$

where the constant value of 0·4 represents the drag coefficient and a further constant which for air at n.t.p. and metric dimensions is equal to 0·5. This latter value is derived on the basis of air density $\rho = \gamma/g$[kg/m³ × sec²/m.] = 0·1255 [kg.sec²/m⁴] and velocity V[m/sec] as:

$$\Delta p = (\rho/2)\ V^2 = 1{\cdot}255/(3{\cdot}6^2 \times 2g) =$$
$$= 1{\cdot}225/(12{\cdot}96 \times 19{\cdot}62) = 0{,}0048 \approx$$
$$\approx 0{\cdot}5(1/10)^2 \text{[kg/m}^2\text{]}$$

This represents the dynamic pressure of a plate with an area of 1 sq. meter, i.e., $C_d = 1$. Consequently, the value of the drag coefficient in the above resistance equation will be $C_d = 0{\cdot}8$, so that re-written in English dimensions:

$$R = 7{\cdot}75W + 0{\cdot}8 \times 0{\cdot}26A \times [(V+7{\cdot}5)/10]^2 \text{ [lb.]}$$

The derivation of the constant value of 0·26 is given in Ref. (1) and (2). The power required by the locomotive is given as:

$$N = RV/375\eta \text{ [h.p.]}$$

where η [decimals] is the power plant efficiency. Neglecting the latter, the required power at the wheels is plotted in Fig. 2. The rolling resistance $a = 7{\cdot}75$ [lb. per ton] appears to be somewhat on the high side and so does also $C_d = 0{\cdot}8$. Introducing the average values derived from the B.T.C. test bulletins, the resistance equation will read:

$$R = 4W + 0{\cdot}7 \times 0{\cdot}26A \times$$
$$\times [(V+7{\cdot}5)/10]^2 \text{[lb.]}$$

The resultant power required at the wheels is also plotted in Fig. 2. At 60 m.p.h., the difference amounts to about 85 h.p. To some extent this might account for the remark (3) that "all the performances are equal to or better than the calculated haulage capacity."

Comparison of data

It is of interest to compare this data where the magnitude of C_d sets the tone to the dependence of the values of the tractive resistance r and R on the second power of vehicle speed with equations recently published for diesel-hydraulic locomotives (4). These relate to the 60·4-ton D.B. Type V100 B-B locomotive and converted to English units read as follow:

$$R = 253 + 41{\cdot}3\ (V/10) + 20{\cdot}3(V/10)^2 \text{ [lb.]}$$

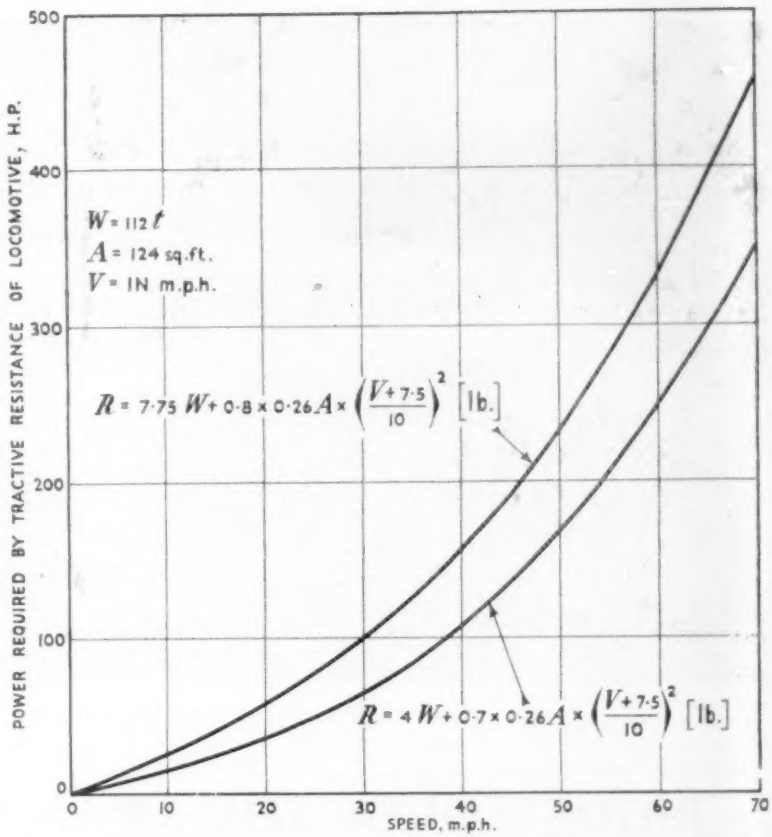


Fig. 2—Calculated power requirements of Roumanian diesel-electric locomotive

and

$$R = 224 + 92{\cdot}5\ (V/10) + 7{\cdot}2(V/10)^2 \text{ [lb.]}$$

The first equation relates to the locomotive coasting and includes losses resulting from the transmission while the second equation applies to the locomotive doing work at the head of the train.

Transmission and coupled axles

In accordance with the second equation, $a = 3{\cdot}7$ [lb. per ton], this being in line with B.R. results. At speeds above 10 m.p.h. and particularly in the speed range of 20 to 80 m.p.h. the values of r or R are influenced by the component proportional to $(V/10)$ and not by C_d and the $(V/10)^2$ factor. This suggests that the effect of transmission and coupled axles action is of considerable influence here, although it must be appreciated that the equations concerned appear only to fit the experimental data and not to provide values actually relating to the factors concerned.

Thus, the first equation provides an approximate drag coefficient value of $C_d = 0{\cdot}6$ while for the second equation this is reduced to about 0·21. At the same time, the consant value relating to $(V/10)$ is more than doubled.

References

1. Koffman, J. L. "Tractive resistance of diesel railcars and locomotives," *Diesel Railway Traction*, January, 1950.

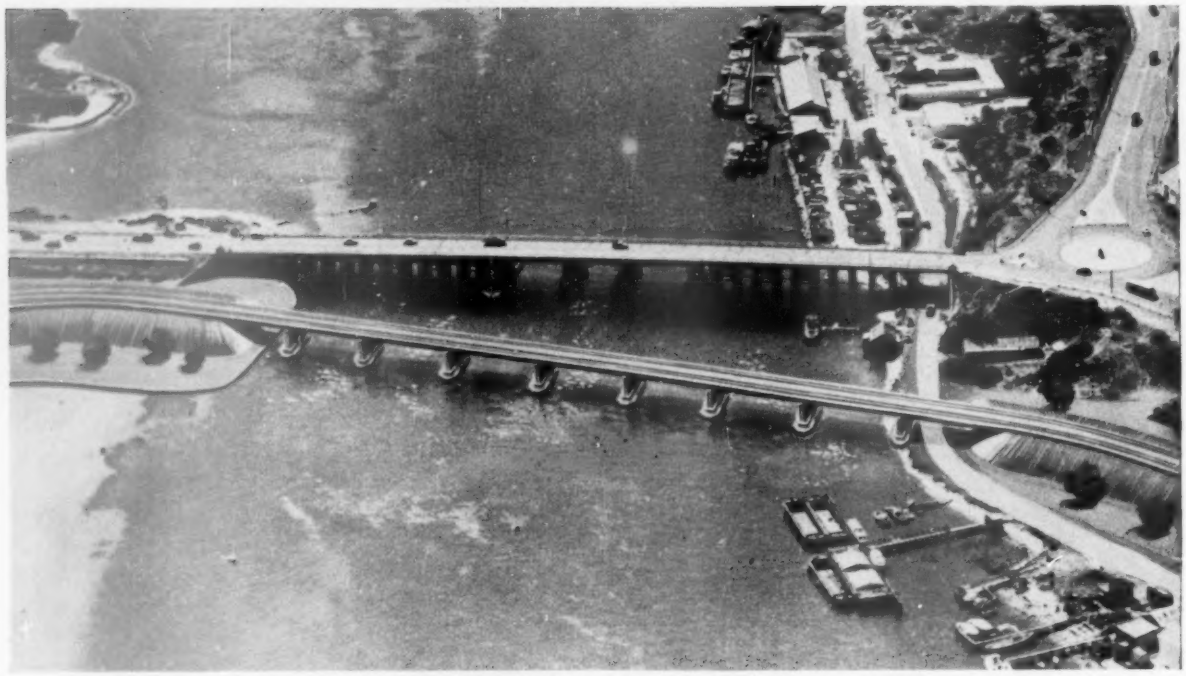
2. "Locomotive resistance," *Diesel Railway Traction*, August, 1959.

3. "Large locomotives for Roumania," *Diesel Railway Traction*, November, 1959.

4. Friedrich, K., and Fürst, W., "Die Nebenbahn-Diesellokomotive V.100 der Deutschen Bundesbahn," *Glasers Annalen*, Nov., 1960, pp. 572-585.

CHRISTMAS AT PADDINGTON

Christmas decorations at Paddington Station, British Railways, Western Region



Artist's impression of the Swan River Bridge at Fremantle

BRIDGE OVER THE SWAN RIVER at Fremantle, W.A.G.R.

Nine continuous deck spans on piers to carry the double-track main line

Several factors have combined to make a new bridge necessary to carry the double-track main line of the Western Australian Government Railways over the Swan River at Fremantle.

The existing bridge was constructed as a single-track timber structure in 30-ft. crown strutted spans during the 1890's, a second track being added on a separate and parallel structure which was constructed to a similar pattern during the early 1900's. The north abutment of both bridges was affected by floods in 1926 and several 30-ft. spans were added when the subsequent repairs were carried out. Although the timber beams have been progressively replaced with steel girders and piles affected by marine borers have been cradled, maintenance is uneconomical.

New location

To permit up-river extension of Fremantle Harbour, the bridge has been located approximately 350 yd. upstream of the existing bridge, and adjacent to the road bridge. This will permit the deepening of the channel in this reach of the river, and make it available for larger vessels unrestricted by bridges. Initially, the heaviest 3-ft. 6-in. gauge traffic will be able to be carried, and later 4-ft. 8½-in. gauge loadings either in addition to 3-ft. 6-in. gauge on one track or on both.

Superstructure

The bridge is designed as a nine-span continuous structure, with seven 100-ft. spans and two end spans each of 75 ft. Two rows of girders spaced 15 ft. apart support each track and are carried on common piers and abutments. The continuous spans are anchored at the pier on the south bank of the river, specially designed to resist accumulated longitudinal forces in the superstructure. The foundations also are so designed to withstand these forces transmitted through rocker bearings and the pier.

The design enables the other piers to be resistant only to vertical and lateral loads apart from slight longitudinal pressure from bearing friction. They can thus be slender in the side elevation of the bridge and economical. The girders are carried on expansion bearings in the form of a pair of 14-in. dia. high-strength steel segmental rollers bearing on high-strength steel plates secured to the intermediate pier-caps.

Involute teeth at the ends of the bearings prevent progressive longitudinal displacement and transmit transverse loading on the bridge.

Design of piers

The piers are supported on a reinforced concrete base, the cap of two clusters of 18-in. dia. steel piles driven into the river bed to an average depth of at least 40 ft. and subsequently filled with reinforced concrete. Borings have shown a soft limestone bed of considerable depth near the south bank, but in the centre of the channel and towards the north bank there are sand deposits of various densities.

The girders are of shop-welded mild-steel fabricated in lengths of about 50 ft. for carriage to site. They will be erected

to form continuous lengths with high-strength friction-grip bolts. These bolts will also be used for securing the cross bracings forming a horizontal system between the two rows of spans transferring the lateral forces to the ends of each span; there they will be communicated to the piers through a common-brace frame.

Fixing cross-timbers to girders

Designed to facilitate the fixing of the cross-timbers to the girders, the latter are provided with special lugs welded to them. Apart from bearing stiffeners over the piers there are no outside stiffeners in this design; there is normal stiffening inside the girders. This makes for considerable reduction in maintenance.

The superstructure is designed in accordance with B.S.153 to carry 20 British Standard Units of type R.A.I. loading with the AREA impact factor for non-reciprocating type locomotives. Two tracks will be carried on the bridge, and although standard-gauge track is pre-supposed, present planning provides for 3-ft. 6-in. gauge track on the upstream side and dual-gauge (3-ft. 6-in. and 4-ft. 8½-in.) track on the downstream side. The approach gradients of 1 in 100 and the 660-ft. vertical curve on which the bridge is to be built, have been designed to permit a clearance of 28 ft. 6 in. above mean sea level in the navigation channel of the river.

The site investigation was carried out by engineers of the Chief Civil Engineer's Department, Western Australian Government Railways. Messrs. G. Maunsell & Partners are the Consulting Engineers, who designed the bridge and who are now supervising the construction. For the bridge construction the State Government has accepted a tender of £A.345,025 by R. J. Davies, Pty., Ltd. contractors of Jolimont, with £A.44,497 for additional steel sheet piling. The weight of steel is about 600 tons, and completion is to be early in 1963.

CENTRALISED TRAFFIC CONTROL in Sweden

An important installation on long route used mainly by mineral trains and returning empties

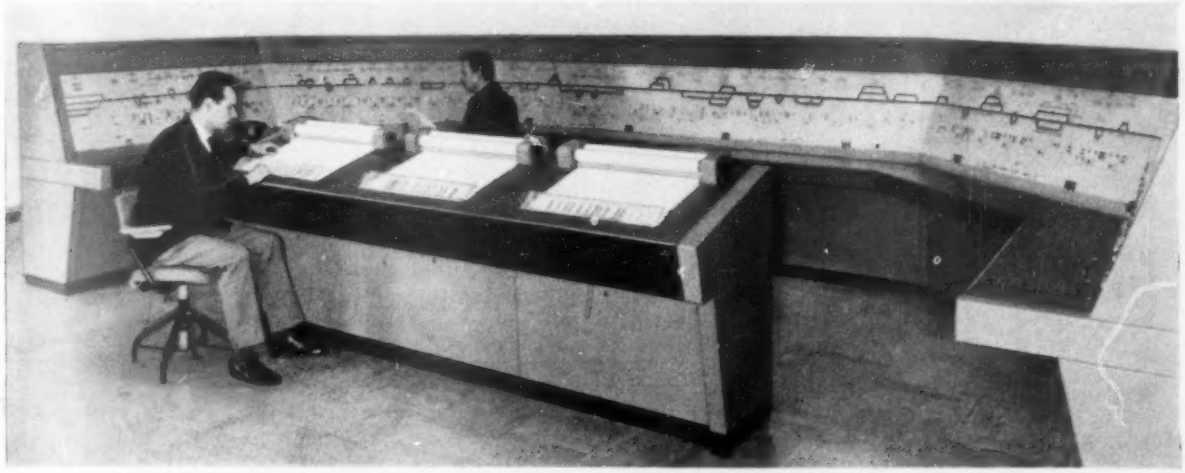
ONE of the largest centralised traffic control installations in Europe is that which has now given some months of satisfactory operation in Sweden between the Baltic port of Oxelösund and the mining centre around Ludvika, with branches from Rekarne to Kolbäck and from Valskog to Köping. Amounting to 186 miles of single-track route, this installation was made by the well-known Trafik A.B. Grängesborg-Oxelösund Järnvägar (T.G.O.J.), but since the c.t.c. came into full operation this railway has been absorbed by the Swedish State Railways (S.J.), though the T.G.O. company, which has extensive mining properties, remains active.

Predominance of freight

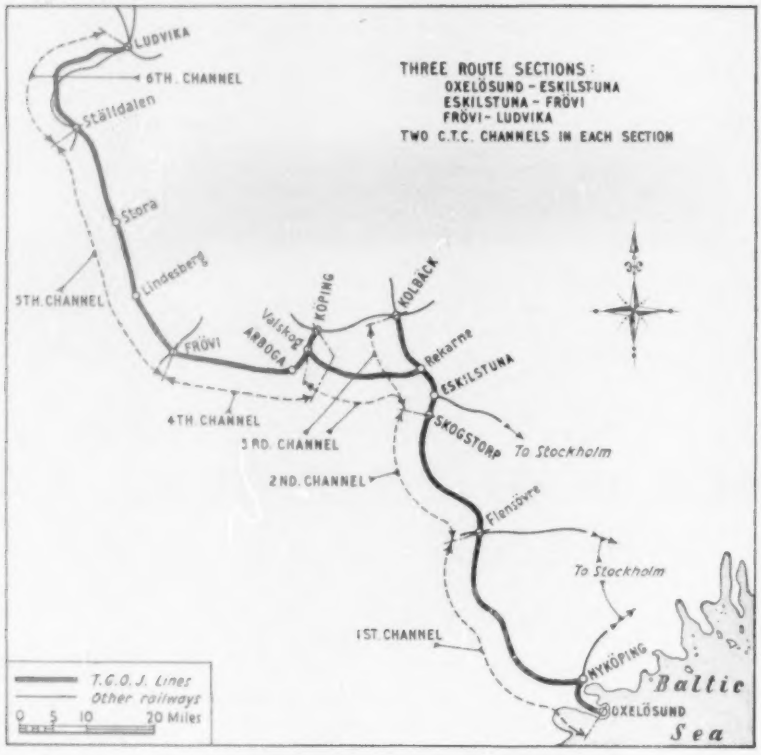
Though ore trains predominate over the line, there is also passenger traffic, worked, as are the freight trains, by electric locomotives, and also by diesel railcars. Over the main part of the route (see map) there are about 40 trains a day, and c.t.c. was introduced to give the greatest possible control over operation and at the same time economise in working expenses by a reduction in staff. At several places junction is made with Swedish State Railways routes.

The installation as a whole was undertaken by Siemens & Halske and comprises the equipment for the centralised control of the 186 miles of route and the 38 wayside stations. All relay interlocking was applied to these stations and to another 16 loading sidings out on the line in the mining areas, and more than 300 isolating and power switches of the 15-kV. single-phase traction-supply system also are controlled over six transmission channels (two for each of the three route sections), each connected via two conductors. The channels in the northern section (Frövi-Ludvika) have considerable length, and it was necessary to boost the input impulses with transistor amplifiers.

Centre of the c.t.c. system is the control room located at Skogstorp, a little to the



30-ft. c.t.c. panel and control desk at Skogstorp



Map of area controlled by c.t.c. installation

south of the geographical centre of the whole line. Additional to the c.t.c. line equipment, the stations at Oxelösund and Eskilstuna are each provided with a route-relay interlocking signal cabin, and so can control all movements in their area and are independent of the c.t.c. up to their starting signals.

Close train sequence

Out on the line there are 71 fully-automatic block sections which permit close train sequence; and there are also 79 level crossings, the warnings and barriers of which are all automatically-operated.

Equipment at Skogstorp c.t.c. room is supplemented by indication of the class of train and by three train graphs to register the point-to-point time actually taken by each train; and the c.t.c. itself gives the further possibilities of switching to local shunting or run-through operation. The three train graphs cover the three sections into which the whole route is divided, viz., Oxelösund-Eskilstuna, Eskilstuna-Frövi, and Frövi-Ludvika. These sections were converted to c.t.c. separately, in sequence from the south.

Central control station

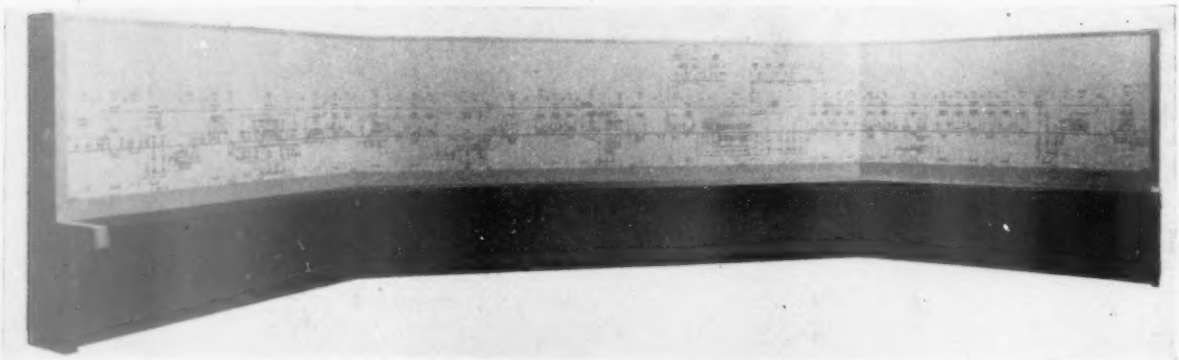
The main control panel and illuminated track diagram at Skogstorp has indicators for position of all points, locking of routes, track occupation, positions of signals, direction of traffic, class of train, heating of points, loudspeaker for transmission of orders, telephone for personnel, emergency stop, and c.t.c. working and failure indicator. There are also operating pushbuttons for 280 pairs of points, 335 signals, key releases for locally-operated pairs of points at the 16 loading sidings, slotting for three opening bridges, and interlocked signals controlling working of adjacent Swedish State Railways stations and junctions.

An isolating switch control panel and diagram has indications of the isolating and power switch positions, lines without voltage, direction of current in short circuits, running direction of trains, occupation of station tracks, and other functions, and has operating push-buttons which are used for the control and reversing of 315 isolating and power switches.

In the central control station is the relay equipment for c.t.c. control, over six channels, for transmission of 1,800 controls from the centre, and 3,500 return indications to the centre, for indicating the class of train and for circuit connections to the control panels.

Line equipment

Spread over the wayside stations are 40 control panels or desks with illuminated track diagram, indicators, operating push-buttons for points, signals, isolating and power switches, and relays for cabin circuits and c.t.c. Out on the line are 214 a.c. 100 cycles per sec. track circuits with impedance bonds and two-position motor relays for control of block signals; 137 non-rotating frequency converters (50/100 cycles) for feeding the line track circuits from the traction mains; 80 emergency inverters (12 volts d.c./200 volts a.c.) as standby feed for the circuits of the level-crossing protection in event of a mains failure; 71 automatic block locations with control devices for 142 block signals; control devices for 199 warning signals at level crossings, 164 proving signals and 68 level crossing barriers; and the control devices for the 16 loading sidings.



Traction circuit diagram panel, Oxelosund-Ludvika line

Trucks arriving at foot of tippler rank: empty trucks running down to "empty" sidings

TIPPING OF IRON ORE at railway sidings

Automatic handling and emptying of ore wagons with 33½-ton capacity

AT THE foreign ore section of the Spencer Works of Richard Thomas & Baldwins Limited, coupled trains of full wagons are shunted into delivery sidings, the delivery beetles standing at the intermediate back limits with arms retracted. Each of the rakes of wagons is divided by releasing the coupling between the two wagons standing at the beetle intermediate back limit.

Pushbutton control

Using pushbutton control, the track operator positions the beetle behind the rear wheels of the first half-rake of wagons opposite the beetle intermediate back limit, proceeds to the head of the rake, and from there calls forward the appropriate beetle and thus feeds the half-rake of wagons until the leading wagons come under the influence of the approach gradient.

Using the handbrakes, the operator now controls the half-rake of wagons and delivers them to the foot of the tippler approach incline, uncoupling them individually. He then returns to delivery sidings and sends the beetle to intermediate back limit, where it is positioned behind the leading wheels of the first wagon of the second half-rake. This action pulls the wagons to the head of the tippler approach incline, returns the beetle to the end of the second half-rake of wagons, and repeats the procedure used for the first half-rake.

Successive leading wagons are taken automatically from the uncoupled wagons standing at the foot of the incline, propelled up the incline to the tippler and delivered over the crest by the incline beetle. Each wagon is propelled by the beetle rollers in contact with the rear wheel treads.

A wheel-counting device enables the beetle to engage the correct pair of wheels irrespective of their position within the beetle stroke.

The wagon delivered over the crest of the incline is automatically retarded and controlled into gentle contact of rear wheels with the locating stop by a group of Hydrabrakes. From this position, the wagon is automatically engaged by the tippler charger which embraces the rear wheel.

Tipper cycle

With the tippler at rest and all interlocks satisfied, the tippler operator initiates the change wagon cycle, whereupon the charger propels the waiting full wagon into position on the tippler platform, pauses and automatically reverses to return to its engagement position. As soon as the gross weight of the wagon has been taken, the tippler cycle commences.

During the tipping cycle, the appropriate valves of the dust trapping system operate automatically to control the dust level in the settling chamber and prevent blow-back of dust-laden air.

As soon as the tippler returns to rest

with the now empty wagon on its platform, the tare weight is recorded and all is ready for the next wagon cycle change.

As each full wagon is delivered on to the tippler platform, it displaces the empty wagon which runs clear of the tippler and on the kick-back. During the descent to the blind spur of the kick-back and the subsequent descent to the re-marshalling sidings, surplus energy is taken from the wagon by grouped Hydra-brakes.

Short-stroke beetles in the re-marshalling sidings automatically compact the empty wagons as they arrive into rakes ready for coupling up and removal.

The whole system is fully protected by a comprehensive use of sequence interlock and limit switches.

Delivery and pre-marshalling beetles

Delivery and pre-marshalling beetle bodies are robustly constructed of welded-steel plates carrying within, on anti-friction bearings, a drawbar and a pair of roller quadrants.

The drawbar has machine-cut spur teeth on each side and these mesh with teeth cut in the cast-steel quadrants. The quadrants are spring-mounted to allow for rail-height discrepancies and are carried on fixed pins to provide retraction into the beetle body. The quadrants carry a roller assembly providing rolling contact with the rails and the wagon wheels. The haulage rope is connected to the drawbar through a spring shock-absorber assembly. The whole beetle is carried on renewable steel slippers.

Forward haulage automatically projects and reverse haulage retracts, the propelling quadrants before the beetle moves as a whole. The unit can be remotely controlled, no precise positioning being necessary.

Incline beetle

The incline beetle is also strongly built of welded-steel plates, carrying within on anti-friction bearings a compensated drawbar mechanism and a pair of roller quadrants.

The drawbar carries compensated machine-cut spur-tooth racks on each side. These engage with teeth cut in the cast-steel roller quadrants.

The quadrants are vertically spring-mounted to allow for rail-height variations, and carry propelling rollers on extended spigots. The haulage rope is connected to the drawbar mechanism at the extreme forward end of the beetle.

The whole beetle is articulated to permit negotiation of gradient changes while maintaining required wagon clearances, and is carried on renewable steel slippers.

The beetle carries a wheel-counting device, which operates to stop the beetle behind the rear wheels of the leading wagon.

Brake system

The brakes consist of steel arms pivotally mounted in a steel body arranged for fixing to the rails. Pads on the arm extremities contact wagon wheel flanges and the resulting rocking motion is transmitted to an internal, double-headed ram. This in turn forces oil to pass through an orifice, so absorbing energy.

The function of the locator is to hold the waiting wagon with the rear wheels in position for engagement by the charger. The locator comprises a complementary pair of pivoted curved steel arms, which in the raised position engage the wheel flange. It is actuated by an automatic thruster-operated mechanism. This is arranged to pass the leading wheel of each wagon but to engage the rear wheel.

The tippler charger is of double roller-type, and arranged to run on a narrow-gauge track to one side of the main track. The roller-equipped propelling and restraining arms extend from the body to embrace the wagon wheel and are projected and retracted at fixed positions by the operation of appropriate levers engaging ground mounted strikers. Motion for the charger is provided by a rack-and-pinion drive.

Rotaside tippler

The Rotaside tippler is capable of accommodating and tipping the general run of main-line wagons, but has a maximum and minimum height, width, and length of wagons to work to. It comprises a pair of geared sectors 32 in. apart, counterweighted to economise in operating power, and carrying a pivoted rail table to take up variations in wagon width, and a pivot-weighted top retaining beam providing automatic support to wagons of varying heights.

Dust dispersal is effected with the aid of a curved hood which projects over the tippler cradle. When a wagon is in fully-tipped position, it thus is virtually in a closed chamber.

Automatic hopper valve

As the tippler rotates, a normally-closed hopper valve opens automatically and the discharged ore passes through into the hopper, with its dust settling chamber above. A large airvalve in the roof of the settling chamber opens simultaneously with the hopper valve to avoid any blow-back, which would happen if the settling chamber was closed.

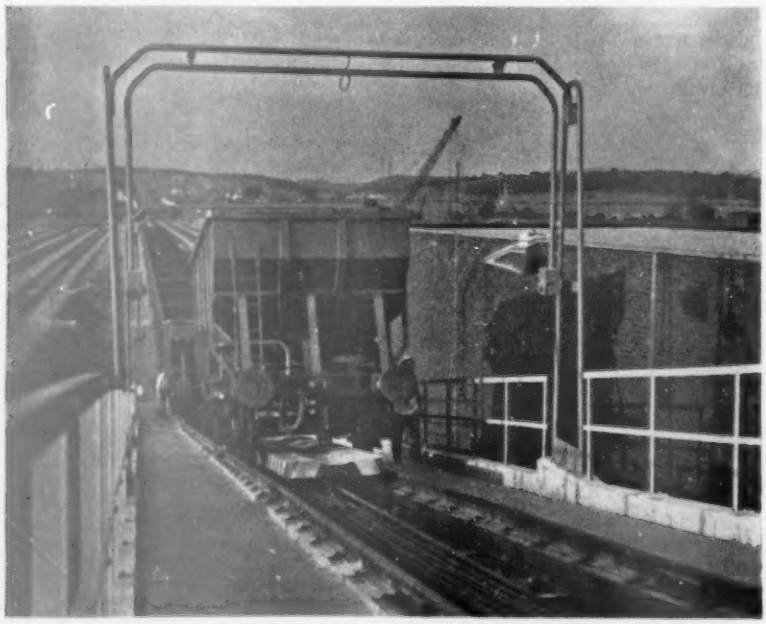
Overall dimensions of the normal wagon in use at Spencer Works is as follow:—

Wheelbase	10 ft.
Height from rail ...	10 ft. 3 in.
Width	8 ft. 4⅞ in.
Overall length	21 ft. 9 in.

Vacuum and hand-operated brakes

These wagons, which are of 33½-ton capacity, are fitted with both vacuum brakes and the normal hand-operated type. "Instanta" couplings make it virtually impossible to leave a rake of wagons tight coupled, the centre link of the coupling being pear-shaped.

The automatic wagon handling and tippler at the foreign ore section of the Spencer Works of Richard Thomas & Baldwins Limited was manufactured by Strachan & Henshaw Limited, Ashton Works, Bristol.



Beetle driving first ore truck up ramp to tippler, each tippler steel arch carries a pair of photo-electric cells

PERSONAL

British Railways

MR. J. H. COLYER-FERGUSSON, Personal Assistant to the Chairman, British Transport Commission, has been appointed Passenger Officer, South Eastern Division, British Railways, Southern Region.

MR. E. C. LONGLEY, Assistant (Technical & Maintenance Staff), British Transport Commission, has been appointed Staff Assistant, Chief Mechanical & Electrical Engineer's Department, London Bridge, British Railways, Southern Region.

MR. L. A. A. TAYLOR, F.R.I.C.S., Estate & Rating Surveyor, British Railways, Eastern Region, who, as recorded in our issue of December 8, has retired, entered the service of the former London & North Western Railway in January, 1913. After serving at various goods stations, he transferred to the Headquarters Office of the Estate Department, Euston, in 1921, where he served in various capacities. In 1939, he became Assistant in the District Estate Office, Crewe, where he was appointed District Estate Agent in 1945, returning a year later to the Estate & Rating Department Headquarters at Euston as Valuation Assistant. In March, 1948, Mr. Taylor was appointed Assistant to the Chief Estate & Rating Surveyor, Railway Executive Headquarters, later becoming Assistant Estate & Rating Surveyor. He was appointed Estate & Rating Surveyor, Eastern Region in 1955.

Mr. L. A. A. Taylor

MR. P. R. DASHWOOD, B.SC. (EST. MAN.), F.R.I.C.S., A.A.I., Assistant Estate & Rating Surveyor, British Railways, Eastern Region, who, as recorded in our issue of December 8, has been appointed Estate & Rating Surveyor, was educated at Cranleigh School. He joined the former Great Western Railway in 1935 in the Surveyors & Estate Department at Paddington, and was appointed a Special Trainee in that department in 1939. Mr. Dashwood served with the Transportation Branch of the Royal Engineers from 1939 to 1946, he was mentioned in Despatches, and was demobilised with the rank of Major, after service in France, Assam, India and Germany. Upon demobilisation he returned to the Headquarters of the Surveyors & Estate Department at Paddington and, in 1947, was transferred to the District Estate Office in Wolverhampton. In 1949, Mr. Dashwood was appointed District Estate Agent, Newcastle-upon-Tyne, North Eastern Region, and, in 1951, Assistant to Estate Surveyor, Marylebone, Eastern Region He was appointed Assistant Estate & Rating Surveyor in 1954.

Mr. P. R. Dashwood

MR. J. S. DOWNES, District Motive Power Officer, Exmouth Junction, British Railways, Southern Region, has been appointed District Motive Power Officer, Nine Elms.

MR. R. BOLTON, Acting Locomotive Works Manager, Eastleigh, British Railways, Southern Region, is to retire on December 31.

MR. R. J. HAXBY, A.R.I.C.S., Assistant to Estate & Rating Surveyor, British Railways, Southern Region, who has been appointed Assistant Estate & Rating Surveyor, Eastern Region, Marylebone, was educated at Kent College, Canterbury. Before he joined the former Southern Railway in 1939, he was articled to a private firm of surveyors and estate agents. He served with the Forces during the war and four years after he had returned to railway service he was appointed to a position in the Estate & Rating Department at Euston, in the London Midland Region. In 1951, Mr. Haxby was appointed an Assistant Surveyor in the Eastern Region and, in 1954, became District Estate Surveyor, Peterborough. He returned to the Southern Region in 1955 as District Estate Surveyor for the London Area and was appointed Assistant to Estate & Rating Surveyor, in 1957.

Mr. R. J. Haxby

MR. M. F. DYER, Freight Officer, West Midlands Division, Birmingham, British Railways, London Midland Region, has been appointed Traffic Assistant to the Divisional Traffic Manager, London (Midland).

MR. J. DUGDALE, Controller, Newcastle-upon-Tyne, British Railways, North Eastern Region, has been appointed Stationmaster, Kirbymoorside.

MR. C. ROSS CAMPBELL, Running & Maintenance Officer, British Railways, Scottish Region, who has retired, joined the former Midland Railway in 1918, as a privilege apprentice, and passed through the various shops and the drawing office. He transferred to the motive power department in 1923, and became an Assistant in the Motive Power Superintendent's Office at Euston in 1934. He became Assistant to the Divisional Superintendent Operation (Motive Power), Derby, in 1935, and District Locomotive Superintendent, Kingmoor, Carlisle, in 1938. In 1941, Mr. Campbell was appointed to a similar position at Newton Heath and, in 1948, became Assistant Divisional Operating Manager (Motive Power), Crewe, shortly after that he became Divisional Motive Power Superintendent (Western Division), Crewe. He was appointed

Mr. C. Ross Campbell

Motive Power Superintendent, Scottish Region in 1954, a position subsequently redesignated Running & Maintenance Officer.

MR. W. H. CAMPBELL, Stationmaster, Newcastle-upon-Tyne (Central), who, as recorded in our issue of December 8, has retired, commenced his railway service in 1914, with the former London & North Eastern Railway at York. Until 1925, he was a clerk at Leyburn Station, when he sent to Ruswarp in a similar capacity. In 1934, he was appointed Stationmaster, Seaton Carew, and subsequently he became Stationmaster at Kirkby Stephen, Catterick Bridge, and Leyburn. In 1940, Mr. Campbell was appointed Inspector in the Darlington District where he was, on several occasions, in charge of Royal Trains. In 1942, he returned to Kirkby Stephen as Stationmaster, but with responsibility for the motive power depot, took up a similar position in Northallerton a year later, and became Stationmaster, Darlington, in 1949. Mr. Campbell was appointed Stationmaster, Newcastle-upon-Tyne (Central), in 1951. At Newcastle-upon-Tyne, Mr. Campbell, has been responsible for the safe passage of over 14½ million people annually.

Mr. W. H. Campbell

MR. A. T. ROTHWELL, Deputy Head of Traffic Section, District Passenger Superintendent's Office, Leeds, British Railways, North Eastern Region, has been appointed Head of Traffic Section.

British Transport Commission

MR. G. C. STEVENS, Assistant (Planning & Productivity), Chief Civil Engineer's Department, British Railways, Southern Region, has been appointed Work Study Assistant, British Transport Commission.

MR. J. B. W. HEYMAN, General Agent, British Railways, Cologne, has been appointed Assistant Director of Studies, British Transport Staff College, Woking.

Junior Institution of Engineers

BRIGADIER C. A. LANGLEY, Chief Inspecting Officer of Railways, Ministry of Transport, has been elected President of the Junior Institution of Engineers.

Overseas

MR. A. H. EARLEY, Chief Ports Manager, East African Railways & Harbours, has been appointed to the new position of Assistant General Manager (Tanganyika).

MR. E. CASSIDY, has been appointed to the board of Coras Iompair Eireann. Mr. Cassidy is President of Clones Chamber of Commerce, Chairman of Ernetex Limited, and a member of the Agricultural Wages Board.

Industrial

MR. C. B. SEELIG, Marketing Manager, General Electric Company, has been appointed Vice-President, Marketing, Le Tourneau-Westinghouse Company.

MR. A. DERBYSHIRE has been appointed Managing Director of Controlled Heat & Air Limited, a member of the Incandescent Group. He succeeds the late Mr. R. D. McMillan.

MR. F. W. DACE has been appointed Product Manager, Tournapulls & Tractors, Le Tourneau-Westinghouse Company.

MR. P. G. HOUCHELL, Assistant Chie Chemist, Research Section, Pinchin Johnson & Associates Limited, has been appointed Chief Chemist of the Group Research Division.

MR. W. ATKINSON ADAM has been appointed Managing Director of the three British divisions of the Yale and Towne Manufacturing Company.

The Directors of the newly formed company of Town Woodhouse Limited, the result of the merger of Woodhouse and Mitchell and Frederick Town & Sons Ltd., are MR. H. VERNON (Chairman), MR. G. S. WOOD, MR. A. KISSACK, MR. E. TOWN, and MR. L. FORBES. MR. J. TAYLOR has been appointed Secretary.

MR. V. R. PREHN, Managing Director, Ruston & Hornsby Limited, is to retire on December 31. He will be succeeded by MR. C. T. ALDERSON.

SIR JULIAN PODE, Deputy Chairman & Managing Director, Steel Company of Wales Limited, will succeed MR. C. R. WHEELER as President of the British Iron & Steel Federation on January 1, 1962. MR. GRAHAM STEWART, Chairman & General Managing Director, Stewarts and Lloyds Limited, has been appointed President-elect for 1962.

MR. F. C. WALMSLEY has been appointed Assistant Divisional Manager, Capacitor Division, British Insulated Callender's Cables Limited from January 1, 1962.

MR. F. J. NASH, Assistant Managing Director (Sales), International Computers & Tabulators Limited, has retired from the board.

MR. A. N. TODD, Deputy Chairman, London Electricity Board, has been appointed Chairman, East Midlands Electricity Board, from January 1, 1962.

MR. J. W. WOMAR, Chief Engineer, Potteries Motor Traction Co. Ltd., has been appointed General Manager of that company in succession to MR. S. J. B. SKYRME (now General Manager, Southdown Motor Services Limited).

Transport Users' Consultative Committee

MR. D. S. M. BARRIE, Assistant General Manager, British Railways, North Eastern Region, York, has been appointed a member of the Transport Users' Consultative Committee for the Yorkshire area until November 30, 1963, in place of MR. F. C. MARGETTS.

The Railway Gazette

MR. A. JOHNSON has been appointed Assistant Editor of *The Railway Gazette* as from January 1, 1962.

Obituary

We regret to record the death, on December 10, of MR. J. S. ROGERS, Vice-Chairman, Ulster Transport Authority.

We regret to record the death, on December 2, at the age of 86, of MR. J. WADDELL, a former Chairman of D. P. Battery Co. Ltd.

We regret to record the death, at the end of November, at the age of 72, of SIR GREVILLE MAGINNESS, Non-Executive Deputy Chairman, Tube Investments Limited.

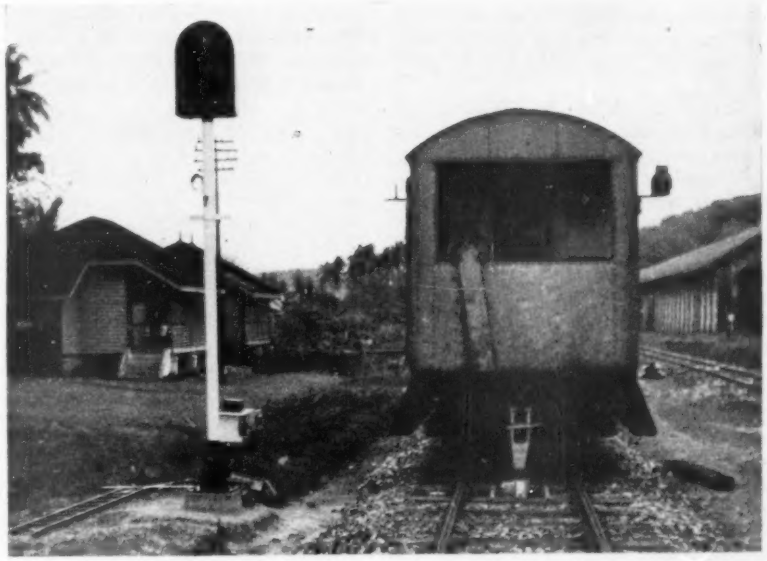
We regret to record the death, in the Comet aircraft accident at Sao Paulo, Brazil, of CAPTAIN H. A. ESTEVARENA, President of the Board of Directors of the Argentine State Merchant Fleet. He was a former General Manager of Buenos Aires Transport.

NEW EQUIPMENT *and Processes*

CHECK-OUT DEVICE

The S.T.I.N. automatic train check-out system is a device designed to indicate when the last vehicle of a train has cleared a track section. It consists of a receiver unit installed in the centre of the track at an appropriate location and a tail magnet which is attached to the rear coupling of the last coach.

The receiver unit consists of an armature and a small built-in permanent magnet. Contact is made at a definite strength between contact pieces on the armature and on the permanent magnet. When a tail magnet passes over the pole piece of the receiver unit, the flux path changes causing the armature to move toward the pole piece in the receiver, breaking one contact on the permanent magnet and making another. The magnetic circuit returns the armature to normal under the influence of the permanent magnet as soon as the tail magnet has moved on. The armature consists of a flexible blade of high-speed action and is not subject to wear or sticking.



Quick action

By obviating the use of springs, the magnetic power is constant at rest. Once movement has started, power decreases in strength as the gap increases—the reverse of a spring action. The presence of an outside field strong enough to start the armature movement ensures full operation of the device.

The tail magnet used is encased in a light-alloy housing enclosing a pole-piece at the bottom It is hung on the final coupling of the train and the attachment hooks are so designed that the magnet has a maximum operating airgap including a safety margin of 6 in. (150 mm.); maximum lateral sway at top speed and with maximum airgap of 1½ in. (40 mm.) to either side; operation of the receiver at speeds up to 100 m.p.h. (160 k.p.h.) with maximum airgap and tail sway. These factors are all interdependent, an increase of any one being balanced by a decrease in one of the others so that the average effect remains unaltered. The actual shape of the tail magnet is governed by the type of coupling hook in use on the railway system but, as well as locating the magnet according to specification, it impedes the use of the coupling hook, a necessary requirement. By this means, a magnet cannot be left within the ramp of wagons forming the train, and it will be removed when no longer required, for safe-keeping. This ensures that only the tail of a train can operate the signal and that the device is used only when actually required. As the signal is operated by breaking contact it is "fail-safe," but an additional circuit-making contact is provided.

Further details can be obtained from Integra A.G. Zurich, Wallisellen, Switzerland, or from the British licensee and manufacturer, Henry Williams Limited, Tolpits Lane, Watford, Hertfordshire.

METAL-TO-METAL ADHESIVE

A metal-to-metal adhesive has been developed which is already causing changes in certain car-production techniques. It might well be applied in other industries to other processes. The bonding substance is a flexible solvent-free adhesive having gap-filling properties and high peel-strength suitable for use on steel or aluminium. Its present use is to bond reinforcing members to boot-lids and bonnet-tops in car bodies.

It is a heat-gelling compound, designed for metal bonding where the assembly will be subsequently heat-treated, thus curing the substance to a tough, rubbery consistency. The adhesive is tolerant of oil contamination, is readily extruded through lengths of ¼-in. bore

high-pressure hose, and will not flow either cold or during cure. The minimum cure time is 30 min. at 270 deg. F. If the time is exceeded, the bond is not impaired, and a satisfactory bond has been obtained after 3½ hr. at 360 deg. F. The compound is non-inflammable, non-drying, and has good storage properties. The curing cycle has been planned round temperatures commonly used in paint shops.

Further details can be obtained from B.B. Chemical Co. Ltd., Ulverscroft Road, Leicester.

STRAIGHT GRIP DRILLS

A series of Dutch-manufactured straight-grip pneumatic drills is now available in this country. The chucks are shrouded for safety and for greater silence in operation, a valuable feature where banks of drills are in use. The bodies of the drills are sheathed in plastic which is both easy to keep clean and which insulates the hand of the operator from the cold generated in metal pneumatic tools. The drills are operated by a lever, but this is detachable to reveal a pressbutton for use, if preferred. Available speeds are 500, 900 and 1,500 r.p.m. with a $\frac{5}{16}$-in. chuck for use on stainless steel and nimonic and similar alloys, and 3,800 r.p.m. with a ¼-in. chuck for general workshop use.

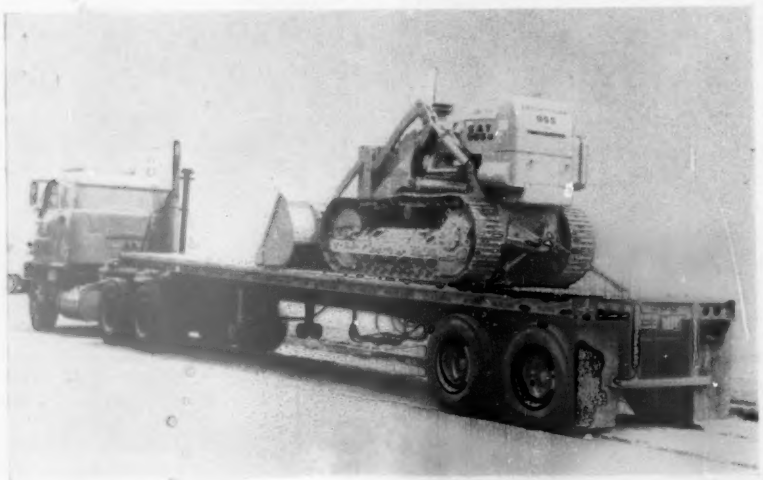
Further details can be obtained from the United Kingdom distributor, B. O. Morris Limited, Morrisflex Works, Briton Road, Coventry.

CONCRETE TAMPING TRESTLE

The causeway tamping trestle allows concrete to be tamped speedily and economically. The trestle is a tripod structure on vertical tubular steel legs shouldered to meet centrally. The design enables the trestle to be withdrawn vertically from the tamped area with no sticking, pulling, distorting or breaking away of the concrete. Through the centre of the tripod passes the tamping bar, the end of which is welded to a bracket which holds the shuttering. The position of the bar, and hence the height of the shuttering, is infinitely adjustable from zero to 18 in. by two pinch bolts. Erecting and adjustment can be carried out by one man in a matter of minutes. The top of the tamping bar is shaped to take a 4-in. x 3-in. cross member. The tamping trestle can therefore be used as a platform trestle, with heights adjustable from 40 in. to 53 in. For this purpose, the bar is pin-locked in position at 2-in. centres.

The new trestle is of all-welded heavy-duty tubular steel construction and has no loose fittings to be lost or damaged. Its total weight is 22½ lb., and its closed-down height is 40 in. The feet are at 20½-in. centres.

Further details can be obtained from Causeway Reinforcement Limited, Five Ash Works, Dover Road East, Northfleet, Kent.



HEAVY-DUTY LUBRICANTS

Three new Voler lubricants have been introduced for heavy-duty work. The v.g.g.-graphited grease for ball, roller, or plain bearings is a high melting-point, general-purpose grease-containing colloidal graphite and colloidal MoS_2 to give a greatly increased film strength. The increased stability results in a very long operative life. The grease has been field-tested for the last 18 months. The temperature range is from —20 deg.F. to +260 deg. F. with high stability and film strength.

Voler polythene-spray penetrating fluid designed to release seized nuts, bolts, and other small parts, as a penetrating lubricant for locks, hinges, and similar parts, and to remove surface rust, has been tested over the last two years and now contains superfine colloidal graphite.

Voler V600 multi-purpose compound is intended as a graphited lubricant for use on heavy exposed gears, wire ropes, cables and chain drives. It has an extreme pressure film strength higher than other compounds combined with easy application without heating by pour-brush or stick.

Further details can be obtained from Revol Limited, Exchange Buildings, Quayside, Newcastle-upon-Tyne.

PLATFORM TRAILERS

The Hyster heavy-duty platform trailer, will handle a load of 50,000 lb. concentrated within seven feet. The heavy-duty frame has main load-carrying members fabricated from U.S.S.T-1 steel to obtain a high strength-to-weight ratio. The other frame components are made of high-tensile steel.

The standard-duty platform trailer has a capacity of 45,000 lb. for an equally distributed load. The frame is built of high-tensile steel throughout. Both models have electrically-welded one-piece platform frames designed to resist impact, vibration and road shock. Standard equipment on both models includes four spring tandems, cast spoke wheels, eight 10 x 20 12-ply rayon tyres, airbrakes, I.C.C. lights, reflectors, traffic indicators, and identification lights. Wiring is in conduit and an A.T.A. 7-pole plug-and-socket connection is provided. The decking is made of 1¾-in. tongued-and-grooved pine boarding. A two-speed landing gear, cross members at 18-in. centres, stake-pockets and rub-rails, an I.C.C. bumper, and basket-type spare tyre carrier are also standard. Alternative equipment is available.

Further details can be obtained from Hyster Company, P.O. Box 4318, Portland, Oregon, U.S.A.

20th GENERAL ASSEMBLY OF THE U.I.C.

Nine varieties of automatic coupler displayed at Paris-Montparnasse Station

At the twentieth general assembly of the International Union of Railways held on November 29, in Paris (to which brief reference was made on page 727 of last week's issue), the Chairman, Mr. John Ratter, Member of the British Transport Commission referred to the main activities of the U.I.C. during 1961. These were described in some detail on pages 723-25 of last week's issue. Mr. Ratter laid special emphasis on the setting up of the "forum" which would permit a fruitful exchange of information with overseas countries and work to be carried out jointly with the International Railway Congress Association, the O.S.J.D. and the A.A.R.

Mr. John Ratter, Sir Pierson Dixon, and Mr. H. C. Talbot, British Railways General Agent for France

He also said that the U.I.C. had been responsible for preparing a report on the economic problems facing the railways of member countries of the European Conference of Ministries of Transport, adding that this had made it possible once more to stress before Government authorities the increasing importance of economic studies in the field of transport.

After having referred to the progress of the new headquarters he paid tribute to the Secretary-General, Mr. Louis Armand, who had recently been awarded the Christopher Colombus Prize and thanked the staff of the General Secretariat of the U.I.C. which was carrying out important work with great efficiency.

The Assembly then heard a report on the activities of the U.I.C. submitted to it by the Board of Management, and this report is summarised below.

After having approved the accounts for the 1960-61 financial year, the assembly was informed of the gifts in kind which had been presented by various railway administrations for the new U.I.C. headquarters, and informed that a ceremony would be held on the occasion of the General Assembly of 1962 to inaugurate the new U.I.C. headquarters, which would coincide with the 40th anniversary of the foundation of the U.I.C.

Turning to the question of automatic coupling, the Chairman said that this matter had been examined on several occasions by the U.I.C. and that the studies had now reached a stage when concrete decisions could be taken. Mr. L. Armand, Secretary-General, gave a full account of the question and mentioned in particular that close contacts had been established with the O.S.J.D. so that the coupling which would be adopted could connect with the SA3 coupler of the U.S.S.R. without an intermediate link. He

Sir Pierson Dixon delivering his speech

went on to say that automatic coupling had already been in service for many years in the U.S.A., the U.S.S.R., and Japan, and that it was necessary for Europe to modernise its rolling-stock as screw coupling was completely outmoded.

During the discussion on the "Forum," Mr. S. Sogo, Chairman of the Japanese Railways, stated that he believed the railways had a brilliant future if they were modernised to fulfil present-day requirements, and Mr. M. Savidor, General Manager of Israel Railways, was glad to see the U.I.C. entering this new field of activities which would enable overseas networks which could not take part in meetings to receive the valuable information the U.I.C. could give. He felt that greater attention should be paid to questions of management, to economic problems, and to staff training. The General Assembly then approved the application for membership of U.I.C. and O.R.E. submitted by the Senegalese Railways, the State organisation set up in Syria for the study and the construction of railways, and the association of German private railways, V.D.N.E., as an associate member of the U.I.C. Mr. H. Gschwind, Chairman of the Swiss Federal Railways, was appointed Chairman-elect of the U.I.C., and will take over office from Mr. Ratter as from 1963. On behalf of all the members of the assembly, Mr. E. Upmark, General Manager of the Swedish State Railways, thanked Mr. Ratter for the brilliant manner in which he had conducted the debates and for what he had done as President of the U.I.C. during the past year.

Mr. Ratter gave a dinner party at the Cercle Interallié for the members of the Board of Management and General Assembly and their ladies. In his speech, Mr. Ratter said how honoured the U.I.C. was by the presence of Sir Pierson Dixon, British Ambassador to France, and Lady Dixon, and how glad he was to see so many railway friends from all over the world attending the dinner. He felt the U.I.C. could be proud of the fruitful outcome of its work and the contribution it was making toward international co-operation.

In his reply, Sir Pierson Dixon said how

Sir Pierson and Lady Dixon with Mr. and Mrs. John Ratter

pleased he was to attend this U.I.C. function, particularly in view of the fact that Great Britain was Chairman Administration for 1961 and 1962, in the person of Mr. Ratter. He was aware of the valuable work accomplished over a number of years by the Union, and pointed out that its meetings were renowned for the friendly atmosphere which prevailed during the debates and that other international organisations might well

follow this example. The British had always been keen on railways and, in spite of the present enthusiasm for road travel, hundreds of young boys could be seen in England taking down engine numbers. Adults were showing greater interest now that there was talk of a structure over or under the Channel, and this would undoubtedly bring Great Britain closer to Europe. The British Ambassador concluded by congratulating France for the great progress it had achieved in the field of railways since the end of the war.

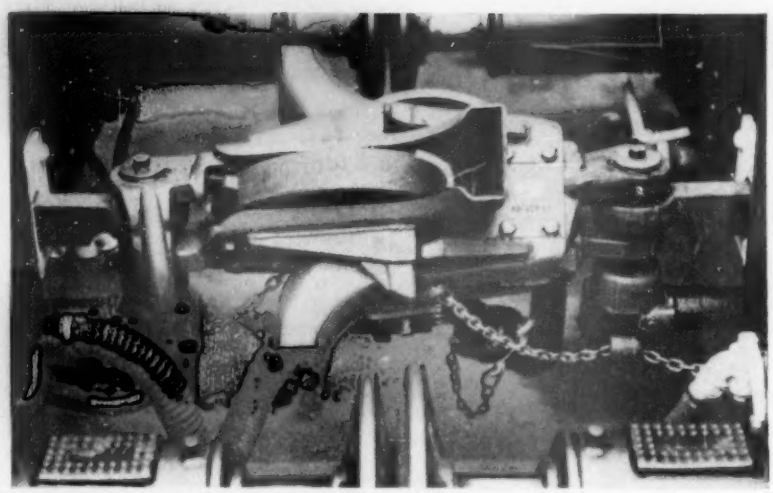
Automatic coupling display

A display of nine different types of automatic couplers was arranged at Paris-Montparnasse Station. At this, after welcoming Mr. R. Buron, French Minister of Public Works & Transport and the many high-ranking railway delegates present, Mr. Andre Segalat, Chairman of the Board of Directors of the French National Railways (S.N.C.F.), said how pleased he was that it had been possible to arrange this display in Paris on the occasion of the General Assembly of the U.I.C. Mr. Ratter thanked Mr. Buron for the interest he was taking in the problem of automatic coupling which was so important from the social and technical standpoint. He also expressed his appreciation for all the arrangements made by the S.N.C.F., and called on Mr. Armand to explain the various aspects of the problem.

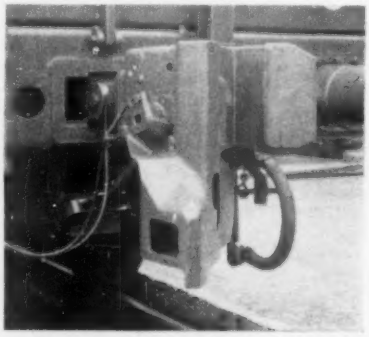
Hand-operated coupling

Mr. Armand said that, at the present time, the railways of Europe with the exception of those in the U.S.S.R. made use of a hand-operated system of coupling for interconnecting vehicles and forming trains. The railways in the United States, the U.S.S.R., and Japan used couplers which functioned automatically as soon as the vehicles came into contact.

He stressed the considerable advantages automatic coupling provided in the social, technical, and economic spheres. It did away with the arduous and dangerous work required of shunting staff. As an automatic coupler had no components which required raising by hand, it could be made much stronger than a manually-operated coupler and heavier trains could be run. Whereas the heaviest trains in Europe very rarely exceeded 3,500 tons, in the United States, for example, automatic coupling enabled trains of 10,000 tons to be operated. Locomotive power was put to better use and, as a much higher tonnage could be forwarded by each train, traffic over the lines could be increased without running more trains or raising costs.



B.R.: Dowty automatic coupling for simple traction



S.N.C.F.: Unicoupler automatic coupling for simple traction

As the coupling of vehicles fitted with automatic couplers was instantaneous, faster marshalling and train formation operations enabled wagon turn-round to be improved.

Greater potential with fewer wagons

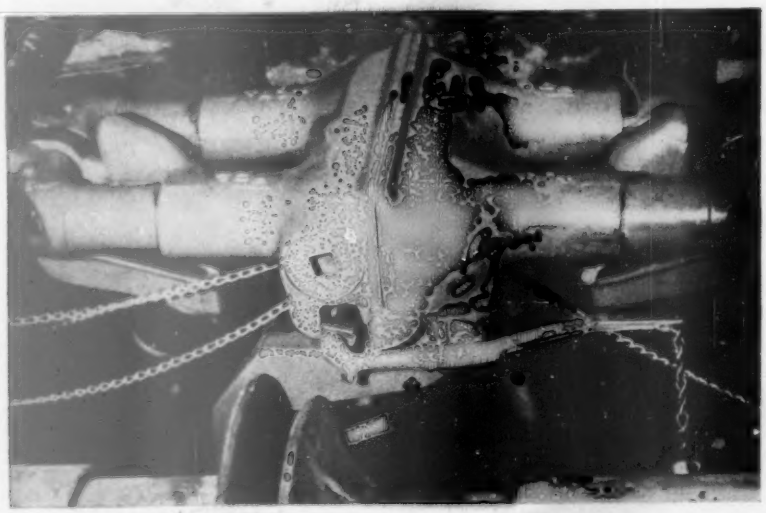
Less rolling-stock was required to transport the same quantity of goods, as the wagon output potential was higher. There was much less risk of saturating marshalling yards and it was therefore possible either to obviate the necessity of installing new equipment or to give up using poorly equipped marshalling yards. Precious minutes could be saved in standing time at important passenger stations when sections of trains arriving from several points had to be coupled up.

It could thus be said that the introduction of automatic coupling was a further stage in the automation of the railways.

The member railway administrations in Europe of the International Union of Railways therefore had come to the conclusion that the reasons for introducing automatic coupling were becoming increasingly imperative. They had not been alone in studying the problem: the Council of Ministers of the European Conference of Ministers of Transport (E.C.M.T.) had examined it a few days before in Paris; the International Labour Office, the United Nations Economic Commission for Europe, and the Council of Ministers of Transport of Eastern European countries were also giving it their full attention.

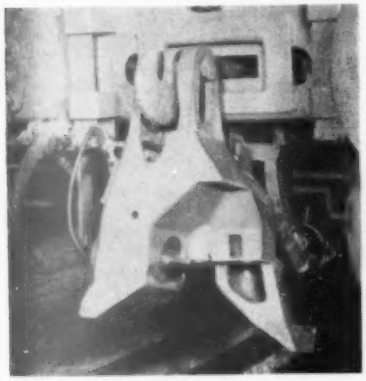
Mr. Buron said that the European Ministers of Transport followed the work of the U.I.C. with the greatest interest, and would very carefully study the technical proposals put forward by that body.

An explanation of the various couplers on display was then given by rolling-stock experts of the French National Railways and some types of couplers were demonstrated. These can be considered as the initial results of the technical studies undertaken by railway



C.F.F.: Fischer drop automatic coupling for simple action

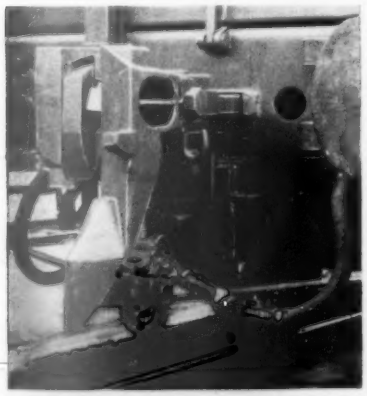
experts in association with industrial concerns to design a modern automatic coupling system well adapted to the requirements of the European railways. Some of the systems shown had been proposed following the invitation to submit tenders, on the basis of



S.N.C.F.: Compact drop automatic coupling for simple traction

specially compiled specifications, sent out in 1960 by the U.I.C. Office for Research & Experiments to manufacturers all over the world.

These specifications are very similar to those of the Organisation for the Collaboration of Railways (O.S.J.D.), grouping the



S.N.C.F.: Willison automatic coupling for simple traction

railway networks of Eastern Europe, which are also members of the U.I.C., as well as those of the U.S.S.R. and certain Asiatic countries.

The two sets of specifications are shortly to be combined to enable a single type of European coupler to be devised.

The essential conditions stipulated by the U.I.C. are given hereunder:—

(i) The heads of the automatic coupler shall have a tensile strength equal to at least 150 metric tons in traction (present screw coupling: 85 metric tons) and 200 metric tons in compression.

(ii) The coupling gear shall first be used in a "simple traction" system, the buffers being retained; with this system the tensile strength shall be 100 metric tons.

(iii) The coupling gear shall be easily convertible for incorporation, at a later stage, using the same heads, in a "buffing and draw" system, the buffers being removed.

(iv) The automatic coupler heads shall provide for the automatic coupling of the continuous airbrake pipe; it is desirable for them to be designed so that supplementary components can be fitted to ensure the automatic coupling of a second airbrake and low-tension electric circuits.

(v) The coupler heads shall couple with the U.S.S.R. Railways SA.3 without an intermediate link.

(vi) So as to enable, if this be possible, the progressive introduction of automatic coupling, it is desirable for the coupler heads to be

D.B.: Compact (B.S.I.) automatic buffing and traction coupling

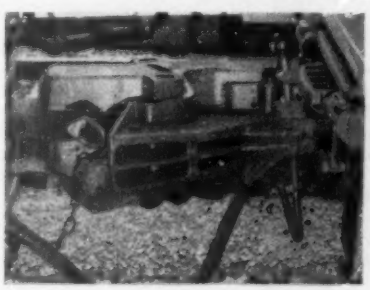
easily connectible with ordinary coupling, having a coupling screw and a hook ("composite coupling").

It is interesting to note that couplers Nos. 1, 2, 3, 4, and 10 can be coupled to the U.S.S.R. SA.3 coupler (No. 11) without an intermediate link, while couplers Nos. 5, 6, 7, 8, and 9 do not fulfil this condition.

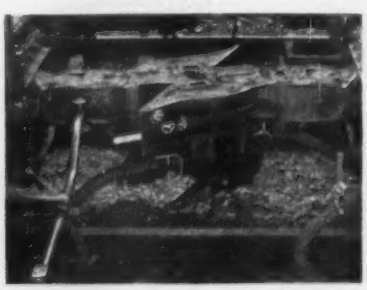
D.B.: Scharfenberg automatic coupling for simple traction

	Administration	Type	Peculiarities
1.	Ö.B.B. (Austrian Federal Railways)	Unicoupler	B.D.—The wagons have a reinforced underframe design by Staberg
2.	S.N.C.F. (French National Railways)	Unicoupler	S.T. and B.D.
3.	D.B. (German Federal Railway)	Unicoupler	S.T. and B.D.
4.	S.N.C.F. (French National Railways)	Willison	S.T. and B.D.
5.	C.F.F. (Swiss Federal Railways)	Georg Fischer	S.T.—head that can be dropped down to achieve composite coupling
6.	B.R. (British Railways)	Dowty	S.T.—head that can be swung back to achieve composite coupling
7.	S.N.C.F. (French National Railways)	Compact (Boirault)	S.T.—head that can be dropped down to achieve composite coupling
8.	D.B. (German Federal Railway)	Schaku (Scharfenberg)	S.T. and B.D.
9.	D.B. (German Federal Railway)	Compact (B.S.I.)	S.T. and B.D.
10.	D.R. (German State Railways)	O.S.J.D.	S.T. and B.D.
11.	O.S.J.D. (Organisation for the Collaboration of Railways)	SA.3	B.D.

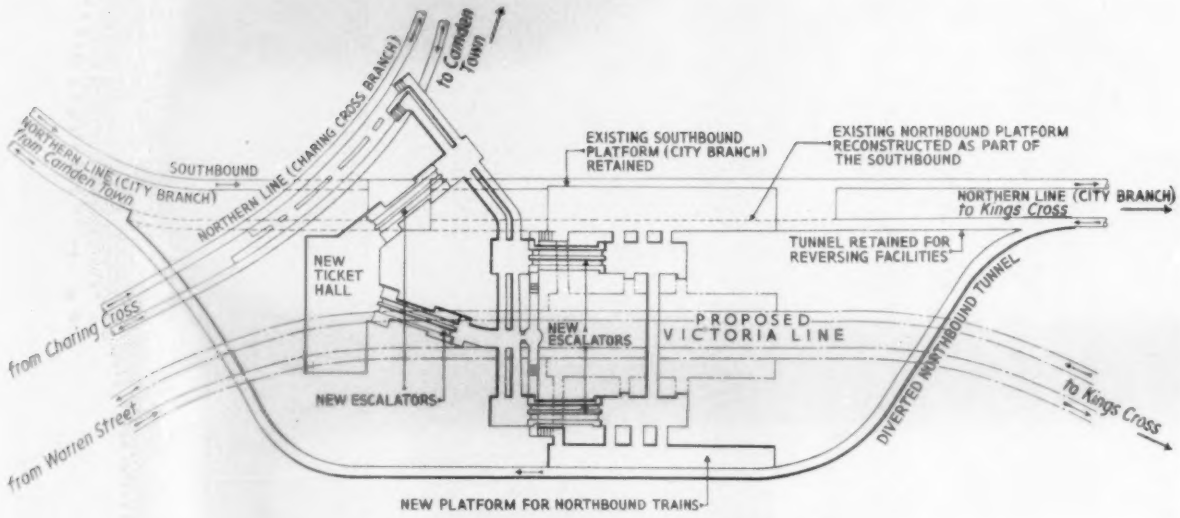
S.T.—simple traction coupler B.D.—buffing and draw coupler



U.S.S.R.: SA.3 automatic coupling



D.R.: Bantzen automatic coupling


to Camden Town
NORTHERN LINE (CHARING CROSS BRANCH)
NORTHERN LINE (CITY BRANCH) from Camden Town
SOUTHBOUND
EXISTING SOUTHBOUND PLATFORM (CITY BRANCH) RETAINED
EXISTING NORTHBOUND PLATFORM RECONSTRUCTED AS PART OF THE SOUTHBOUND
NORTHERN LINE (CITY BRANCH) to Kings Cross
TUNNEL RETAINED FOR REVERSING FACILITIES
NEW TICKET HALL
from Charing Cross
from Warren Street
NEW ESCALATORS
NEW ESCALATORS
PROPOSED VICTORIA LINE
DIVERTED NORTHBOUND TUNNEL
to Kings Cross
NEW PLATFORM FOR NORTHBOUND TRAINS

Plan showing proposed reconstruction of Euston Underground Station

Reconstruction of Euston Underground Station

A new sub-surface ticket hall, four flights of twin escalators, and interchange subways are to be provided by the London Transport Executive at Euston Underground Station. They will replace the existing corridor ticket hall and the three 50-year-old lifts. The reconstruction scheme also provides for the Euston platforms of the proposed Victoria tube line to be incorporated later.

Euston is served by both Charing Cross and City branches of the Northern Line. It is used by nearly 11 million passengers a year and provides important interchange between the tube and the main-line station above.

Under the first stage of the scheme, on which work started on December 13, part of the booking hall, the first pair of escalators, and a subway will be built for the Charing Cross branch of the Northern Line.

Further stages which are planned for a later date in connection with reconstruction of the main-line terminus or the building of the Victoria Line will include completion of the booking hall, the installation of the remaining flights of escalators, and the construction of passageways to serve the City branch. There will also be interchange at low level with the Charing Cross service.

New tunnel

The present northbound City Line will be diverted in a new tunnel to allow the platforms of the proposed Victoria Line to be built in between the two City branch tunnels. This will give easy cross-platform interchange between the two lines and will mean that the north and southbound City services will have their own platforms instead of sharing an island platform as now.

For some weeks, preliminary work for the first stage has been going on in Drummond Street, which fronts Euston main-line terminus and is the site of the new Underground station ticket hall. Gas mains, electricity, Post Office cables, and drainage have already been diverted. A working shaft will shortly be sunk in the middle of Drummond Street to enable engineers to construct the escalator shaft and subway for the Charing Cross branch.

Work on the ticket hall will start later when British Railways' plans for the rebuilding of Euston main-line station are more advanced.

One of the escalator shafts will pass under the present site of the Doric Arch.

Separate entrances

The work now being started under the first stage will cost about £700,000 and the target date for finishing it is mid-1964. Then, for a time, there will be two separate entrances to the Underground station at Euston. The first will serve the Charing Cross branch and the second, comprising the existing booking office and lifts, will continue to serve the City branch until the further stages are completed. Passengers will still be able to interchange below ground between the City and Charing Cross platforms.

Railway-telephone system between Crewe and Nottingham

The 28 railway-telephone circuits which serve the administrative and traffic control requirements between Crewe, Stoke, Derby, and Nottingham in the London Midland Region of British Railways, are now inadequate to meet the increased demands brought about by modernisation and electrification.

The establishment of the Line Traffic Managers at Crewe and Derby has added to the load and made an increase in the facilities a matter of urgent necessity.

The open wire telegraph pole routes on which all the present circuits depend are obsolete so far as long distance communication is concerned, and it would be impossible to accommodate on the poles the additional wires required to provide the desired results.

To enable the new demands to be met in the shortest possible time, aerial plastic-insulated cables are being provided throughout the section concerned and 12-circuit carrier telephone systems are being installed having a capacity for 60 circuits. Of these, 57 will be used for telephone purposes and three for teleprinter communication.

The additional circuits, when associated with the automatic telephone exchanges to be installed at Derby, Nottingham, and Stoke, will enable the telephone operators to dial direct to extensions connected to the other exchanges in the area, and will be a step towards the trunk dialling system envisaged under the Modernisation Plan.

The cost of installing the cables and carrier telephone systems will be £150,000 and the work will be completed early in 1963.

New method of shunting

As part of a major scheme for structural alterations to Offenburg Marshalling Yard, on the main line of the Deutsche Bundesbahn (German Federal Railway) from Mannheim to Basle, it was necessary to carry out extensive modifications and amplifications to the signalling system. Certain notable features of the new installation are the high degree of centralisation of operating control and a completely new technique for the automation of hump shunting installed by Siemens & Halske A.G. Eleven mechanical signalboxes of conventional type, by which the shunting operations have been hitherto controlled, are being replaced by a single modern centralised cabin.

The control of the fully automatic humping operations at Offenburg yard is based now not on convential track circuits but on the use of electronic axle counters. So long as the automatic control of the points is governed by track circuits, momentary interruption of the current flowing through the axles, or an axle of poor electric conductivity, is sufficient to cause faulty movements or even derailments of the humped wagons in the distribution zone. The German Federal Railway therefore desired to carry out a large-scale trial of a new method for the control of the distribution points.

In principle, axle counters have the advantage compared with track circuits that they are indifferent to poor electric conductivity of wagon axles or to interruptions of axle-current circuits. They also permit the saving of considerable permanent-way expenditure

for the installation and maintenance of insulated rail joints which in the humping zone are particularly heavily used and exposed to considerable wear.

It was, therefore, decided to arrange for the points at Offenburg Yard to be controlled by axle-counter circuits. Magnetically-acting rail contacts were installed at the beginning and end of each counter section. These contacts act on a counter mechanism which reports the section as occupied as soon as one axle is registered in the section concerned. If, at the end of a section, the number of axles counted out corresponds with the number of axles counted it, the counter mechanism again reports the section as being free.

For the first time in Germany Siemens & Halske used an axle counter based on electronic working rather than on the conventional selector system. These counters work with small magnetic cores of the type used for the storage devices of electronic computers. The entire counting process in the signal cabin is therefore completely noiseless, invisible, and free from mechanical movements of any kind. The service life of these electronic counters is practically unlimited. They are indifferent to interference voltages and so are excellently suited to work with the relay-type signalling installations. Another advantage is that the absence of insulated rail joints enables the rails to be continuously welded, an unusual feature in marshalling yards.

Retirement of Mr. David Blee

At a luncheon held at the Midland Hotel, Derby, on December 15, in connection with the retirement of Mr. David Blee, General Manager of the London Midland Region of British Railways, the guests were: Mr. R. L. E. Lawrence, Line Traffic Manager, Derby; Mr. G. J. Aston, Movement Superintendent to Line Traffic Manager, Derby; Mr. A. B. Arundale, Commercial Superintendent to Line Traffic Manager, Derby; Mr. A. H. Madden, Motive Power Assistant to Line Traffic Manager, Derby; Mr. A. F. Fielding, Operating Assistant to Line Traffic Manager, Derby; Mr. W. O. Reynolds, Divisional Traffic Manager, London (Midland); Mr. L. W. Leppington, Assistant Traffic Manager, London (Midland); Mr. J. C. Rogers, District Operating Superintendent, London, St. Pancras; Mr. K. N. Sidebotham, District Commercial Manager, London, St. Pancras; Mr. C. L. Kelly, District Motive Power Superintendent, London Kentish Town; Mr. G. B. Gray, Divisional Traffic Manager, Nottingham; Mr. R. D. Gardiner, Assistant Traffic Manager, Nottingham; Mr. J. A. K. Gray, District Operating Superintendent, Nottingham; Mr. S. Audinwood, District Motive Power Superintendent, Nottingham; Mr. D. D. Scott, District Motive Power Superintendent, Toton; Mr. G. W. Miller, District Motive Power Superintendent, Derby; Mr. W. Jackson, District Motive Power Superintendent, Leicester; Mr. L. A. Metcalf, District Commercial Manager, Leicester; Mr. A. S. Parker, District Motive Power Superintendent, Wellingborough, and Mr. H. Bullough, District Commercial Manager, Derby.

Presentation to Mr. David Blee at the luncheon at Derby

Dr. Richard Beeching at the Derby Locomotive & Carriage Works

Dr. Beeching's visit to Derby

Attending the annual dinner of the Derby Railway Engineering Club, Dr. Richard Beeching, Chairman of the British Transport Commission, combined with this visit a tour of the Locomotive & Carriage Works, Derby, on the London Midland Region of British Railways. This was the Chairman's first visit to a large railway works and he said that he was very favourably impressed. The tour also included a visit to the British Railways School of Transport, the Research Centre, and the Apprentice Training School. The guests were received by the President of the Derby Railway Engineering Club, Mr. T. F. B. Simpson, and they included Mr. J. F. Harrison, Chief Mechanical Engineer, British Transport Commission; Mr. R. C. Bond, Technical Adviser, B.T.C.; Mr. A. E. Robson, Chief Mechanical Engineer, British Railways, London Midland Region; Councillor T. Earnshaw, Mayor of Derby; Mr. P. J. Noel-Baker, M.P.; Sir William A. Stanier, and Mr. J. T. de Koningh, Work Director of Netherland Railways.

The accompanying illustration shows (left to right): Mr. T. F. B. Simpson, Dr. Richard Beeching, Mr. H. W. Mear, Assistant Works Manager, Derby; and Mr. A. E. Robson, inspecting a traction-motor armature in the Traction-Motor Overhaul Shop, of the Locomotive & Carriage Works at Derby.

Diesel-hauled trains in Scotland. The Scottish Region, British Railways, is introducing 23 type 2 diesel locomotives built by the Birmingham Carriage & Wagon Co. Ltd., and powered by 1,250 h.p. Sulzer engines. Together with four diesel shunting locomotives they will replace 45 steam engines.

CONTRACTS AND TENDERS

£1-million railway wagon order from New Zealand

The Pressed Steel Co. Ltd. has received an order for 900 open wagons worth nearly £1 million, from New Zealand Government Railways.

Strachan & Henshaw Limited has received an order to install ore wagon handling and unloading equipment for South African Railways at Port Elizabeth. The order is worth £136,000 and completion is scheduled for the end of 1962.

British Railways, Eastern Region, has placed the following contracts:—

General Cleaning Contractors Limited: office and window cleaning at Kings Cross station and adjacent premises

W. & C. French Limited: construction of concrete inverts and steel sheet-piling training walls at underline bridge No. 155 over River Rother, between Woodhouse and Waleswood (closed). Demolition of engine repair shop, workshops, stores, coaling plant, etc., conversion of office building into temporary messing and ablution accommodation, construction of high-level loading dock and reconstruction of superstructure to underbridge No. 25, and partial reconstruction and widening of underbridge No. 82 at Grimesthorpe Freight Depot, Sheffield

Tersons Limited: maintenance and renewal, etc., of permanent way

Thomas Fletcher & Co. Ltd.: reconstruction and widening of Temple Mills Lane overbridge No. 658, between Stratford and Lea Bridge

Cowans, Sheldon & Co. Ltd.: dismantling, overhaul, modification of one 50-ton Goliath crane at Sheffield Bridgehouses, and re-erection, testing and painting of same at Mile End.

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Australia:

204 sets of bogie components for pedestal type side-frame roller bearing freight bogies

1 double-headed grinding machine, to specification

816 journal sets, packaged roller bearings and adaptors.

The issuing authority is the Supply and Tender Board, South Australia, Gawler Place, Adelaide, to which bids should be sent. The closing date is January 15, 1962. The Board of Trade reference is E.S.B./38298/61.

From India:

222 items of steel, including blooms, billets, slabs, etc., spring steel, plates and sheets totalling 13,038·02 metric tons.

The issuing authority is the Director, Railway Stores, Ministry of Railways (Railway Board), Rail Bharan, Raisina Road, New Delhi, to whom bids should be sent. The tender No. is S-18. The closing date is January 16, 1962. The Board of Trade reference is E.S.B./38549/61.

Supply of equipment, technical supervision, and maintenance for six months, of route relay interlocking at Liluah.

The issuing authority is the General Manager, Eastern Railway, Calcutta, to whom bids should be sent. The tender No. is ER/LIH/R.Relay/VI. The closing date is May 14, 1962. The Board of Trade reference is E.S.B./37906/61.

Design and supply of 16 and 20 separate sets of electrical traction equipment, 25 kV. single-phase, a.c. to suit metre-gauge electric locomotives as per specification EL.141-61.

The issuing authority is the General Manager, Chitteranjan Locomotive Works, Chitteranjan, West Bengal, India, to whom bids should be sent. The closing date is March 8, 1962. The Board of Trade reference is E.S.B./37908/61.

From Pakistan:

15,000 mild-steel dog spikes, 5⅜ in. x ⅝in.

The tender No. is 211-S/299-ISO. The closing date is January 16, 1962. The Board of Trade reference is E.S.B./38263/61.

1 heavy-duty wheel-turning lathe.

The tender No. is P6/635/4/61. The closing date is January 13, 1962. The Board of Trade reference is E.S.B./38262/61. The issuing authority for the above tenders is the Chief Controller of Purchase, Pakistan Western Railway, Empress Road, Lahore, to whom bids should be sent.

177 ticket dating presses, midget type.

The issuing authority is the Chief Controller of Stores, Pakistan Eastern Railway, Pahadtali, Chittagong, to whom bids should be sent. The tender No. is P4/GB11/324/60. The closing date is January 9, 1962. The Board of Trade reference is E.S.B./38550/61.

From Portuguese East Africa:

Supply of ticket printing machines.

The tender No. is 40/61. The closing date is January 8, 1962. The Board of Trade reference is E.S.B./35492/61.

16 items of telephonic equipment and accessories for the Lourenco Marques Railways.

The tender No. is 8/62. The closing date is January 24, 1962. The Board of Trade reference is E.S.B./38586/61.

The supply of signalling equipment and barriers for two railway crossings.

The tender No. is 9/62. The closing date is February 12, 1962. The Board of Trade reference is E.S.B./38585/61. The issuing authority for the above tenders is the Ports, Railways & Transport Department, Lourenco Marques, to which bids should be sent.

From South Africa:

5 electric motor-driven, rotary vacuum exhausters in accordance with specification 5795 (Annexure A) and electrical specification PLP-M2A-2/61

1 electric motor-driven, rotary vacuum exhauster in accordance with specification 5798 (Annexure B) and electrical specification PLP-M2A-2/61.

The tender No. is F8939. The closing date is January 12, 1962. The Board of Trade reference is E.S.B./38269/61. Bids should be sent to the Chairman of the Tender Board, S.A.R., P.O. Box 7784, Johannesburg.

Supply and installation of underground cables and carrier systems equipped with teleprinter channels as specified

The tender No. is C. 8911. The closing date is February 23, 1962. The Board of Trade reference is E.S.B./36998/61. Bids should be sent to the Chairman of the Tender Board S.A.R., P.O. Box 7784, Johannesburg.

67 items of various types of glass required for the period July 1, 1962 to June 30, 1963. The tender No. is G. 8908. The closing date is January 12, 1962. The Board of Trade reference is E.S.B./38270/61. Bids should be sent to the Chairman of the Tender Board, S.A.R., P.O. Box 7784, Johannesburg.

3,000 sponges, viscose or alternative, 15½ in. x 14½ in. x 1¼ in. thick, resistant to oil and water at 212 deg. F. and capable of filtering 5,400 gal. of water, under 8 in. head per hr. through two sets of 12 sponges each in series.

The tender No. is K. 447. The closing date is January 10, 1962. The Board of Trade reference is E.S.B./38560/61. Bids should be sent to the Chief Stores Superintendent, S.A.R., P.O. Box 8617, Johannesburg.

115 bearings, cylindrical roller, single-row rigid, no lips inner ring, two lips outer ring, high-speed yellow metal cage 130 mm. x 280 mm. x 59 mm. Traction diametrel clearance and traction specification, pinion end, main-motor 1E and 3E locomotives.

The tender No. is K470. The closing date is January 10, 1962. The Board of Trade reference is E.S.B./38554/61. Bids should be sent to the Chief Stores Superintendent, S.A.R., P.O. Box 8617, Johannesburg. The issuing authority for the above tenders is the Stores Department, South African Railways.

From Thailand:

1,000 sets of leaf springs for goods wagons per drawing No. G17-2004/1 and specification No. SM-15/2503.

The issuing authority is the State Railways of Thailand, Yod-Se, Bangkok, to which bids should be sent. The tender No. is 04474. The closing date is January 5, 1962. The Board of Trade reference is E.S.B./38597/61.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

NOTES AND NEWS

Mr. J. Ness accompanied by his wife driving off the "Caledonian Princess"

Chairman's Christmas message. Dr. Richard Beeching, Chairman of the British Transport Commission, issued the following message to all staff:

"This is my first Christmas message to members of the Commission's staff. It may also be the last which I shall send to some of you, as Commission Chairman, because the bigger members of the whole family are going to move a little further apart. Even so, I hope that, like other relatives who are separated, we shall grow even more friendly.

"I have not yet had an opportunity to meet most of you, but the many whom I have met, by their sterling qualities and their friendliness give me the kindest feelings to you all. I do, therefore, wish you most sincerely, on behalf of my colleagues and myself, a Merry Christmas and a Happy New Year."

Electrical company moves. British Insulated Callender's Cable-Burndy Limited has moved to the Parr Industrial Estate, St. Helens.

Visitors to Britain in October. The British Travel & Holidays Association figures for October, 1961, show that 132,000 Overseas visitors came to Britain in October. This was 14 per cent more than in October, 1960. The aggregate figure shows an increase of 9 per cent over those for the first 10 months of 1960.

Special troop trains. Two special trains are to take the Kings Own Yorkshire Light Infantry when they move at the end of this month from Pontefract to Southampton *en route* for Malaya. One will leave on December 29 and the other on December 30, and the North Eastern Region of British Railways has made arrangements for the "V. 2" class engine which bears the regiment's name to haul the second train.

R.B.I. Headquarters. The permanent headquarters of the Railway Benevolent Institution were opened at 29, John Street, W.C.1, on December 18, by Mr. K. W. C. Grand, Chairman of the Board of Management, in the presence of Dr. R. Beeching, President-elect of the Institution for 1962, Maj.-Gen. G. N. Russell, President for 1961, and a representative gathering of guests and members of the Board of Management. The Chairman in his remarks gave a brief outline of the remarkable increase in membership of the Institution during the past 12 months and an indication of the good work which has been done by the Railway Benevolent Institution during the past 103 years. The illustration below shows Mr. Grand at the official opening.

Mr. K. W. C. Grand (left) at the opening of the new R.B.I. headquarters

R.B.I. annuities. At a meeting on December 18, the Board of the Railway Benevolent Institution granted annuities involving an additional liability of £110 a year. Also granted were 161 gratuities amounting to £1,645. Grants from the casualty fund during November amounted to £547 15s. 0d.

The Caledonian Princess. The *Caledonian Princess*, the new vessel for the Caledonian Steam Packet Co. (Irish Services) Ltd., Stranraer-Larne service, made her maiden voyage on December 16 from Scotland to Northern Ireland. Mr. J. Ness, Chairman & Managing Director of the Caledonian Steam Packet Company, drove the first car off the ship at Larne.

World Bank course. A course on development problems for senior officials from less developed countries of French connection is to be held at the World Bank's Economic Development Institute in Washington, D.C., in June and July, 1962.

Company merger. From January 1, 1962, Johnson Bros. (Ground Threads), Ltd., is to be merged with Johnson Bros. (Taps & Dies) Ltd., and the reorganised company will operate from the existing premises at Charles Avenue, Chilwell, under the name of Johnson Bros. (Taps & Dies) Ltd. The management and personnel will remain exactly as before. This merger is a result of the acquisition of both companies by the Sheffield Twist Drill & Steel Co. Ltd.

Machinery by rail. The North Eastern Region of British Railways has arranged for the transport of a shearing machine measuring 67 ft. x 25 ft. x 27 ft. and weighing 128 tons from Harwich to Stockton-on-Tees.

The machine has been imported from Germany, and was carried in six railway wagons. The largest piece weighing 30 ton was loaded in a 50-ton "Weltrol" wagon.

The "Rheingold." The Eastern Region of British Railways has announced that the Hook of Holland departure time of the "Rheingold" express will be at 7 a.m., and the return arrival time at 11.15 p.m.

Institute of Transport South-Western Section. The annual luncheon of the South-Western section of the Institute of Transport was held at the Imperial Hotel, Exeter, on December 7.

National Research Development Council. The annual report of the National Research Development Council has been published and may be obtained from H.M. Stationery Office, price 2s. 3d.

Cheap tickets on Green Line. The London Transport Executive is to introduce a cheap return ticket on Green Line buses during the January sales in the West End of London.

Electrical equipment company. The G.M. Power Plant Co. Ltd., distributors of electrical equipment manufactured by Onan & Sons Inc. of U.S.A., has recently opened a showroom at Richmond Road, Ipswich, Suffolk.

Closing of Penarth Dock Station. The Western Region of British Railways is to close Penarth Dock Station on and from January 1, 1962.

Antofagusta (Chili) & Bolivia Railway Co., Ltd. The estimated traffic receipts for the Chilean Section of the Antofagusta (Chili) & Bolivia Railway Co. Ltd., for month ended November 30, showed an increase of £79,710 over the corresponding period last year, and an increase on aggregate over last year of £2,620.

Nylon bushes under test. Polypenco Limited has announced that the M.C. nylon bushes manufactured by the company, are now under test in France, as dynamo-support bushes on electric stock to provide the necessary wear-resistance, shock-absorbing qualities, and good electrical insulation.

Railway Stock Market

Year-end activity in stock markets received a fillip from the proposed I.C.I.-Courtaulds merger, but caution remained the keynote, because the Chancellor's latest statements have emphasised that no early end of the credit squeeze can be expected and that in general he envisages the pay pause continuing until 1963.

There was little business passing in foreign rails which in most cases are closing the year well below their best levels of the past 12 months, but above the lowest in this period Antofagasta ordinary stock, for example were 16¼, which compared with extremes in 1961 of 24½ and 15; extremes for the preference stock of 37½ and 30½ compare with the current level of 33. Costa Rica ordinary stock, now 35½, had extremes this year of 45 and 33½. Chilean Northern 5 per cent first debentures (extremes 55½ and 46½) have been changing hands around 48½ recently. The following gives the year's highest and lowest quotations for some other stocks compared with those now ruling. Paraguay Central prior debentures (24 and 16½) 23. Brazil Railway bonds (5½ and 2½) 2¾. Guayaquil & Quito assented bonds (60 and 48) 52½. Mexican Central "A" bearer debentures (61 and 56) 56½. Midi Railway 4 per cent sterling bonds (86½ and 77½) 79. San Paulo Railway 3s. units (2s. 4½d. and 9d.) 1s. 8¼d. International of Central America common shares ($21½ and $12) $13½.

Canadian Pacifics, now $44½, have had high and low levels this year of $49¼ and $38⅜. Highs and lows for the 4 per cent debentures of 61⅜ and 52 compare with the current price of 55½. The 4 per cent debentures, now 51⅞, have had extremes of 61¼ and 51⅜.

Elsewhere, White Pass shares, now $13¼, have had extremes in the year of $14⅛ and $9½.

Nyasaland Railways shares moved during the year between 12s. and 8s. 6d. and are currently 11s. Midland Railway of Western Australia ordinary stock (year's extremes 11⅞ and 4½) are now 11. In other directions, West of India Portuguese capital stock had extremes of 140½ and 110: current quotation is 139½. Barsi Light Railway ordinary stock is now 17; extremes have been 19 and 14.

Among representative shares of locomotive builders, engineers and allied companies, Beyer Peacock 5s. shares are now 6s. 7½d., which compares with the year's high and low of 9s. 9d. and 5s. 9d. Charles Roberts 5s. shares have had extremes of 9s. 9d. and 3s. 9d. are now 5s. 6d. Westinghouse Brake, extremes for the year 47s. and 22s., are now 23s. 3d. Birmingham Railway Wagon's extremes of 36s. 6d. and 17s. 6d. compare with the current level of 19s. 6d. North British Locomotive, now 5s. 9d. have had extremes for the year of 10s. 6d. and 3s. 9d. Those for Wagon Repairs 5s. shares have been 26s. 6d. and 18s. 10½d. which compares with the current price of 26s. 3d. G. D. Peters (extremes 20s. 6d. and 15s.) are currently 16s. 10½d.

During the year high and low quotations for the following shares have been as given below together with their current levels. (Pressed Steel) 5s. shares (33s. 7½d. and 15s. 4½d.) 17s. 3d. Dowty Group 10s. shares (42s. and 29s.) 30s. 6d. Leyland Motors (102s. 6d. and 77s.) 88s. 1½d. In electricals, A.E.I. are now 28s. 3d. (extremes 49s. and 27s. 6d.). G.E.C. are 23s. 3d. their lowest for the year; the year's highest was 40s. 3d. Similar figures for English Electric show the year's extremes as 40s. 6d. and 22s. 6d. and the current price 23s. B.I.C.C., now 55s. 10½d., had extremes this year of 64s. 9d. and 49s. 6d.

Forthcoming Meetings

Jan. 3 (*Wed.*). British Railways, Southern Region, Lecture & Debating Society. Chapter House, St. Thomas's Street, London Bridge, at 6 p.m. "Some electric traction developments," by Mr. W. J. A. Sykes.

Jan. 4 (*Thu.*). British Railways, Western Region, Lecture & Debating Society, Headquarters Staff Dining Club, Paddington, at 5.45 p.m. "Traffic costing today—a critical appraisal," by Mr. G. Dickinson.

Jan. 5 (*Fri.*). The Railway Club, Royal Scottish Corporation, Fetter Lane, E.C.4. Display of 16-mm. railway films.

Jan. 10 (*Wed.*). Permanent Way Institution, 222, Marylebone Road, N.W.1, at 6.30 p.m. "Features of maintenance and renewal on London Transport," by Mr. H. Chanter.

Jan. 10 (*Wed.*). Railway Students' Association, London School of Economics & Political Science, Houghton Street, W.C.2, at 6.15 p.m. "Forward into the European Railway Community," by Mr. J. L. Harrington.

Jan. 11 (*Thu.*). London Midland Region Lecture & Debating Society, Friends Meeting House, Euston at 5.45 p.m. "Films in the service of transport," by Mr. E. Anstey.

Jan. 11 (*Thu.*). British Railways, London Midland Region, Lecture & Debating Society, at Preston. "The postal service of the country and its relationship to British Railways," by the Head Postmaster, Preston.

Jan. 17 (*Wed.*). Railway Enthusiasts' Club, Brunswick Club, 30, Wandsworth Road, S.W.8, at 7.30 p.m. Film show on railway electrification.

Jan. 18 (*Thu.*). Model Railway Club, Keen House, Calshot Street, Kings Cross, at 7.45 p.m. "African and Eastern Railways," by Mr. H. L. Denyer.

Jan. 23 (*Tue.*). Institution of Locomotive Engineers, at 1, Birdcage Walk, S.W.1, at 5.30 p.m. "Progress of 50-cycle a.c. electrification on British Railways," by Mr. S. B. Warder.

Jan. 23 (*Tue.*). Institution of Railway Signal Engineers, at Chippenham, 6 p.m. "Automatic Marshalling Yards," by Mr. J. C. Kubale.

Jan. 25 (*Thu.*). Permanent Way Institution, Midland Hotel, Derby, at 6.30 p.m. Slides, photographs and discussion of exhibition at Elst, 1961.

Jan. 27 (*Sat.*). Permanent Way Institution. Annual winter general meeting at the Institution of Civil Engineers, Westminster, at 2.30 p.m.

Feb. 2 (*Fri.*). Institution of Locomotive Engineers, at 1, Birdcage Walk, Westminster, at 5.30 p.m. "Monorails," by Mr. H. H. C. Barton.

Feb. 2. (*Fri.*). The Railway Club, Royal Scottish Corporation, Fetter Lane, E.C.4, at 7 p.m. Annual general meeting.

Feb. 6 (*Tue.*). Railway Students' Association. Annual dinner and dance at 222, Marylebone Road.

OFFICIAL NOTICES

GOVERNMENT OF INDIA, MINISTRY OF RAILWAYS (RAILWAY BOARD)

TENDER No. S-18 of 1961

THE Government of India, Ministry of Railways (Railway Board), on behalf of the President of India, propose to purchase from established and reliable producers, a quantity of about 14,500 tons of steel materials such as billets, plates, sheets, etc.

The tender documents can be had on payment of Rs. 10/- (fifteen shillings) per copy from any of the following offices during working hours on or after Monday, December 4, 1961:

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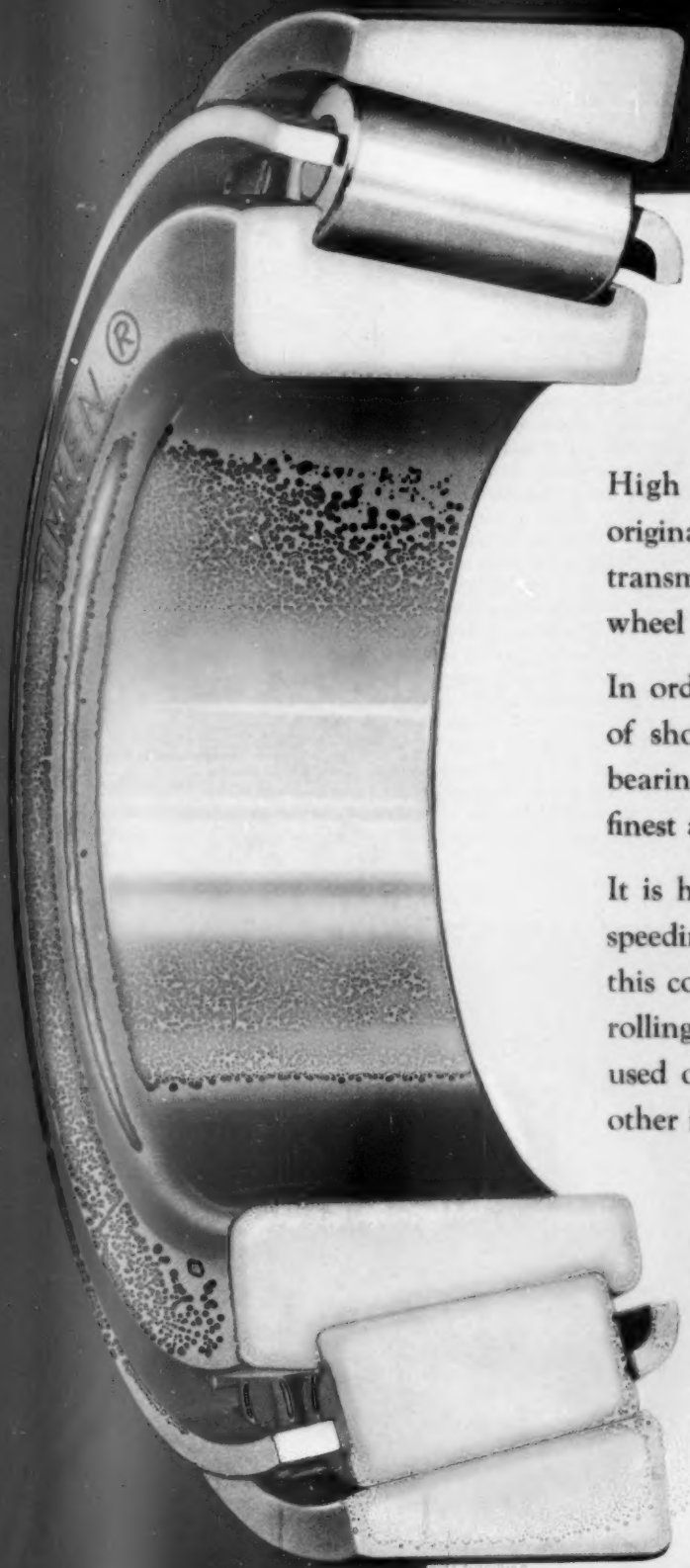
(2) The Director General, India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3.

(3) The Director, India Supply Mission, 2536, Massachusetts Avenue, N.W., Washington 8 DC.

The tenders will be received by the undersigned up to 2.00 p.m. on January 16, 1962, and opened in the office of the Ministry of Railways (Railway Board), New Delhi, on same day.

G. P. BHALLA,
Director, Railway Stores,
For and on behalf of the President of India.



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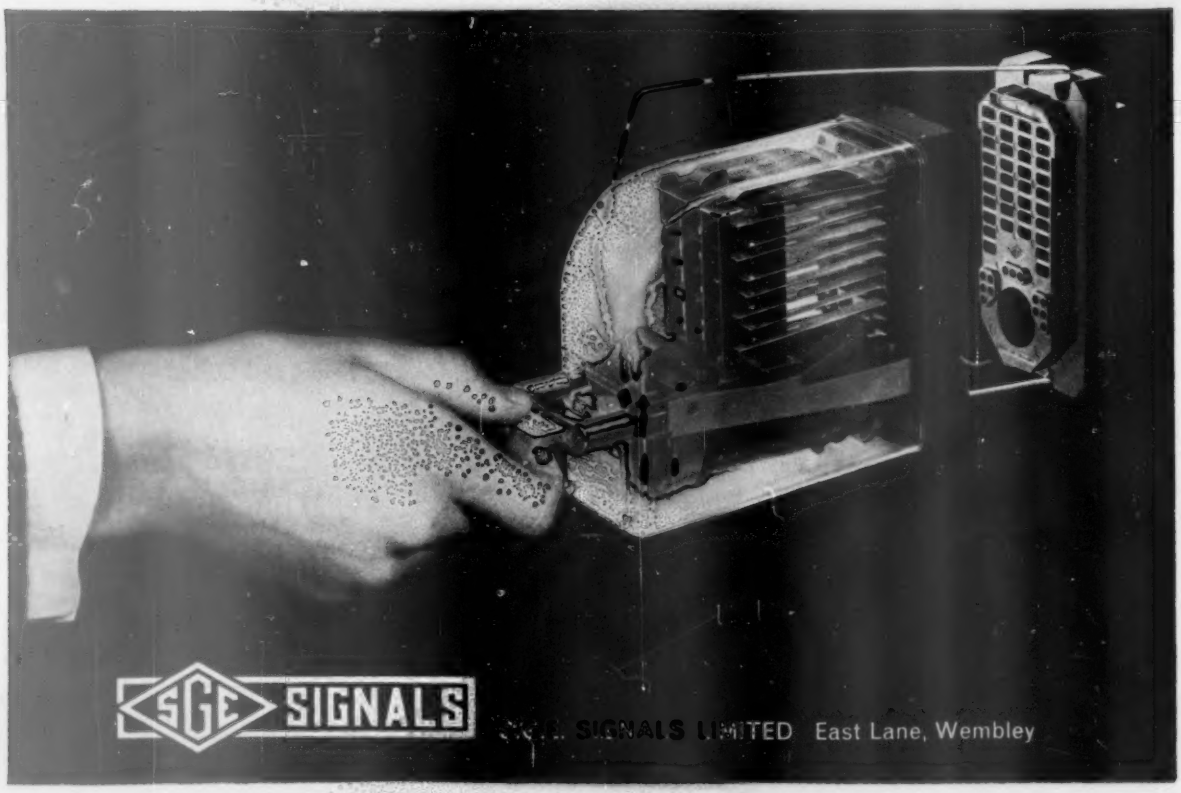

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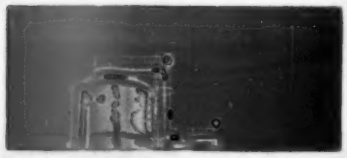

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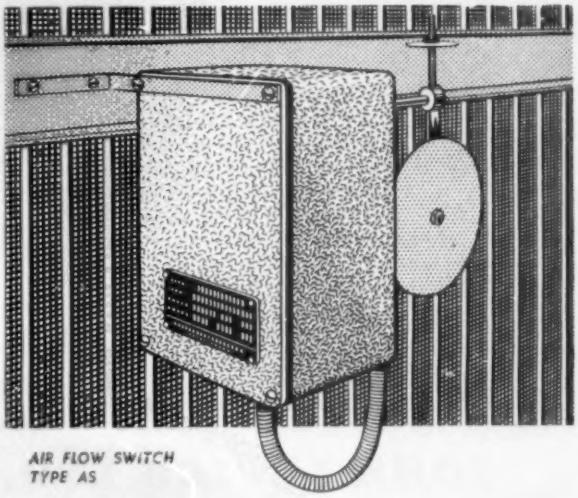

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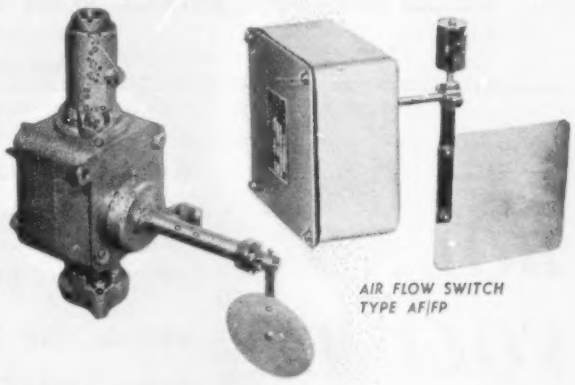

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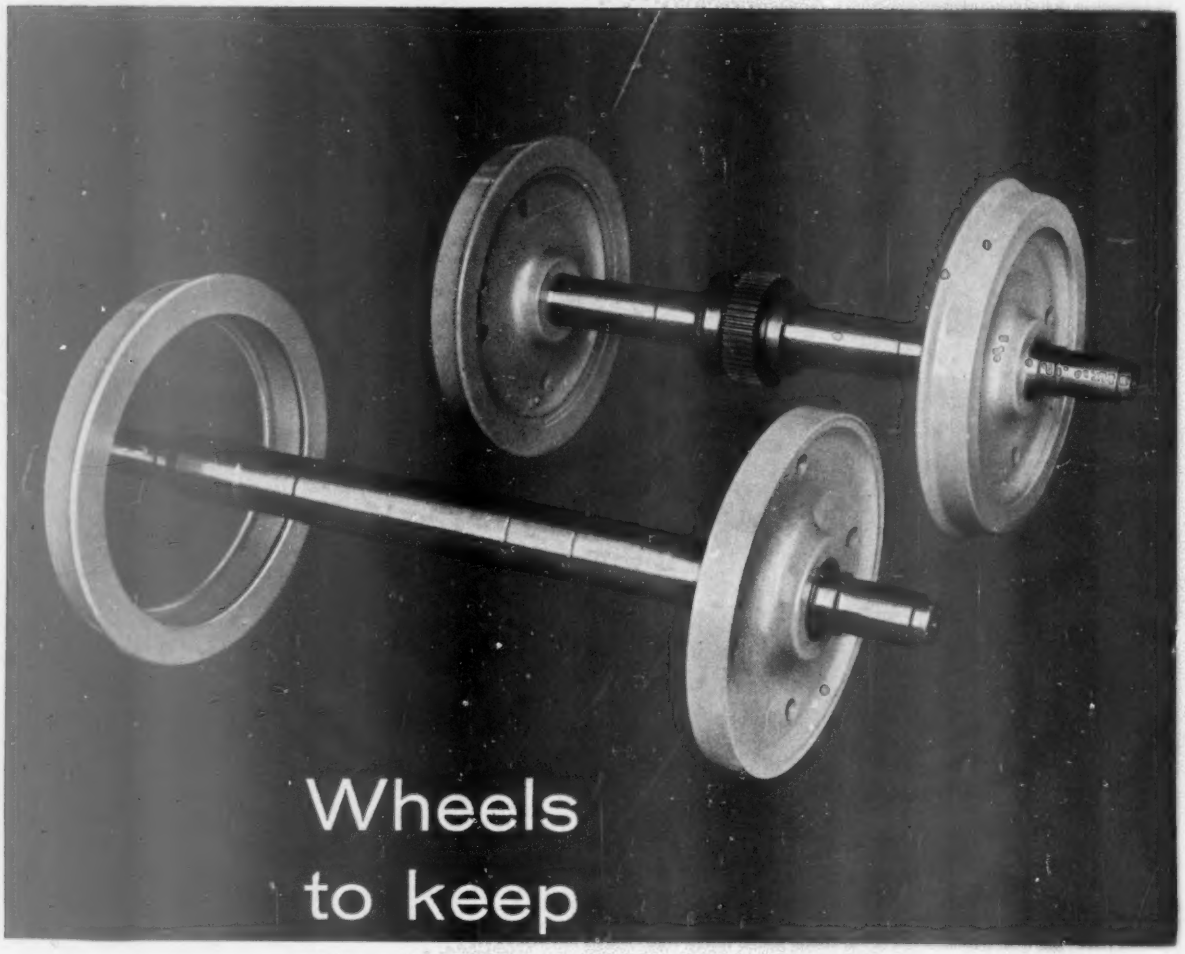

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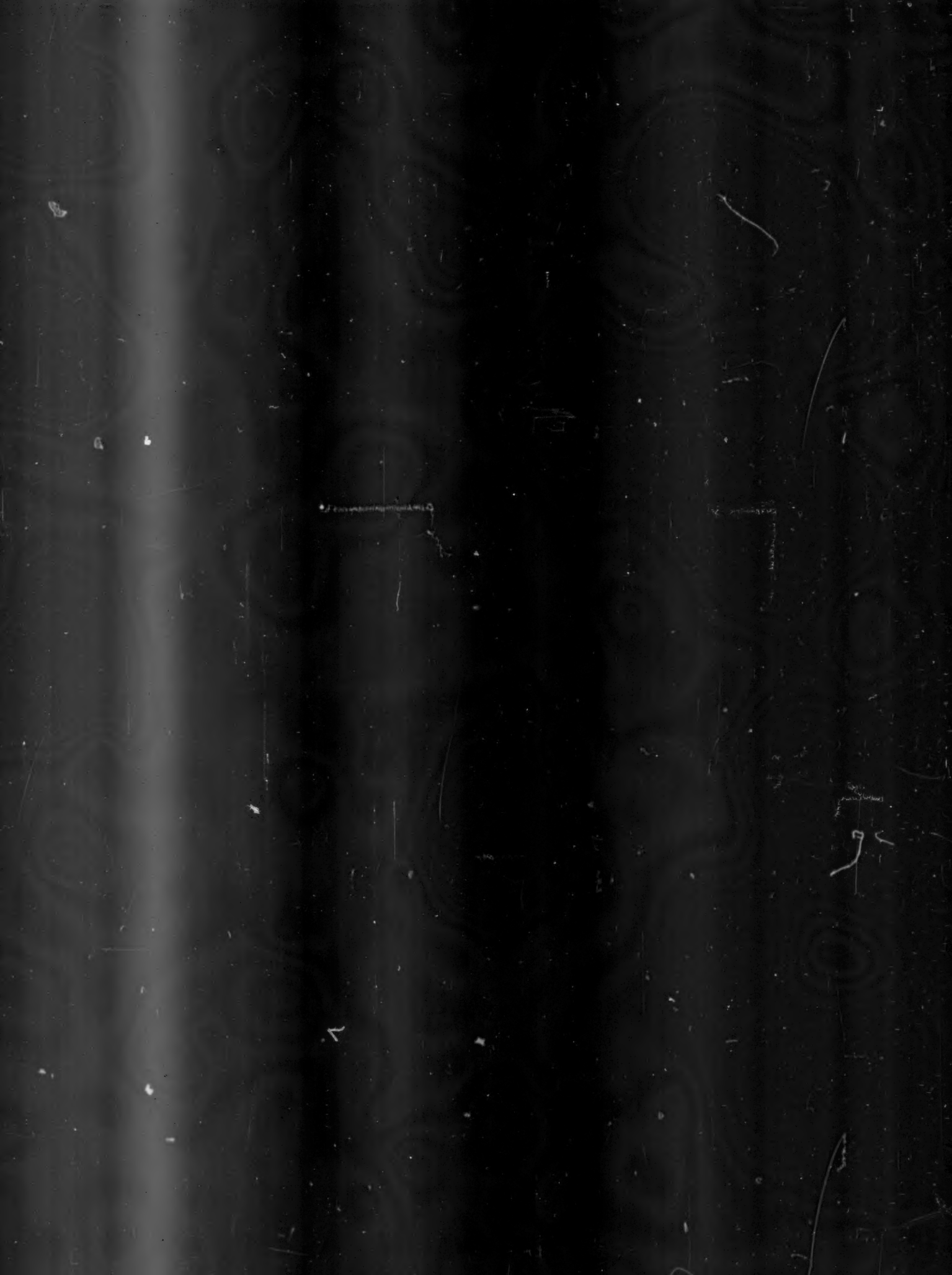
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